DOCUMENT RESUME

ED 121 987 CE 006 744

AUTHOR Franchak, Stephen J., Ed.
TITLE Research and Information on Employment and Training: Local, State and Federal Communications, Results and Utilization. Proceedings of a symposium (Hershey, Pennsylvania, June 9-10, 1975).
INSTITUTION Pennsylvania State Board of Education, Harrisburg.
PUB DATE 10 Jun 75
NOTE 149p.

EDRS PRICE MF-$0.83 HC-$7.35 Plus Postage.
DESCRIPTORS *Conference Reports; Data Analysis; Educational Change; Educational Planning; Employment Trends; Higher Education; Labor Market; Labor Supply; Longitudinal Studies; *Manpower Development; Manpower Needs; Post Secondary Education; *Program Development; Program Planning; Research Methodology; *Vocational Education; Working Women
IDENTIFIERS *Manpower Research

ABSTRACT

The document contains the proceedings of a conference on manpower research at the Federal, State, and local levels. Two papers from the opening general session focus on the interrelationship of economic, demographic, and educational changes based on its effects on occupational education. J. C. Pettinger's keynote speech presented issues regarding the relationship between education and work and S. L. Wolfbein provided the conference orientation. Three concurrent group sessions focused on: (1) labor market data and methodology--three papers providing an overview of Bureau of Labor Statistics programs (M. H. Levine, J. S. Cangialosi, N. H. Rosenthal), (2) manpower research and information for vocational education less than Baccalaureate degree--three papers on the needs of individuals and agencies responsible for occupational education and training, (K. A. Tabler, M. J. Pilo, G. C. Boerrigter), and (3) manpower research and information for higher education: vocational and professional--four papers on the use of occupational supply/demand data as a critical variable for determining program offerings in higher education (G. E. Brehman, Jr., J. G. Kessler, W. E. Taombs, R. D. Newton, H. G. Richard). J. L. Norwood's keynote speech discussed occupational projections for the 1980's. two concluding papers discussed women in the world of work and summarized the symposium proceedings (M. N. Hilton, S. L. Wolfbein). Conference participants are listed. (Author/EC)

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ED121987

Research and Information on Employment and Training: Local, State and Federal Communications, Results and Utilization

Cosponsored by
Pennsylvania State Board of Education
and
U.S. Department of Labor, Region III

Proceedings of a Symposium held at
the Hershey Motor Lodge and Convention Center
Hershey, Pennsylvania
June 9-10, 1975

CE008744

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U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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PREFACE

This is the second year that we have been involved in a conference of this kind. I certainly hope it is not the last because the issues to be considered here are of enormous importance for education in Pennsylvania and for the nation as a whole.

The State Board of Education and the Department of Education co-sponsored this conference in conjunction with the U.S. Department of Labor. Our increasing involvement in the area of manpower research stems from two motivating sources. One is the leadership exercised by the State Board of Education and more particularly by the vocational and manpower committee chaired by Gail Rose. Mr. Rose has--over the course of the past several years--expended a great deal of effort and energy and has successfully focused our attention on some of the manpower issues that we will be facing. The second source has been our own recognition of enormous needs that can only be met through manpower research. Historically we have been relatively unable to meet those needs. Even starting within our own department we have much to do by way of defining personnel needs for the near or distant future. And with declining resources, it is imperative that we shift resources from one area to the other. We no longer find ourselves in the same kind of growth situation that we enjoyed during the 60s. Rather we must use the same dollars for more purposes. The kind of research that underlies the definition of needs and allocation of resources becomes increasingly apparent. Certainly the leadership that the Department of Education seeks to give to schools and colleges and universities depends on a better definition of where we are, where we're going, and how we intend to get there.

Another problem that plagues us constantly has to do with how we avoid the kind of situation that followed not so many years ago in the wake of Sputnik when we geared up and--in many people's view--overproduced in particular areas. We have that problem in the field of teaching today. Ten years ago almost all warm bodies were snapped up. Today we find that thousands of trained teachers are unemployed or underemployed--doing work that is not directly related to their training. That suggests the need for change. Yet we don't want to overreact either and create a shortage ten years from now, finding ourselves again in an unbalanced kind of situation.

The examination of manpower needs, I'm suggesting, is a delicate business.

What kinds of questions do we ask? What are the appropriate answers? Maybe the right question is: Has the U.S. and world moved to the point that change is going to be so very, very rapid and institutional response as a result so increasingly slow that the patterns of education should be genuinely nonspecialized? As a corollary, should we leave virtually all specialization to in-service kinds of programs conducted by the industries requiring the employes?

I have the feeling these are the kinds of questions we should be asking. But I don't have the answers to them. I hope this kind of meeting can give us some direction.

This type of conference and its proceedings also, of course, seek to improve communications between diverse groups with common interests. Hopefully it will do that as it assists us to ask the questions and find the answers in the troublesome area of manpower research.

David W. Hornbeck
Executive Deputy Secretary
Department of Education

Introduction

Educational, economic and manpower planners at the national, state and local levels need labor market information to adapt their plans and programs to existing and future conditions. The challenge facing these individuals and agencies, responsible for providing meaningful educational and training programs and related services to people entering or reentering the world of work, has been increasing over the years. Specifically, the problems focus on individuals' finding suitable employment on the one hand, and industry or employers' finding qualified employees to fill critical needs of the labor market on the other hand. The causes of these problems are economic, social, political and technological. These factors have been the rationale for countless programs aimed at improving the problems of youth and adults.

Federal legislation in the 1960s and 1970s which focused on improving systems for helping individuals to enter or reenter the labor market, has been effective in many respects. To some extent, this statement can be substantiated by statistics showing an unprecedented expansion of occupational education programs with a corresponding increase in enrollments. Programs resulting from the Manpower Development and Training Act, the Vocational Education Act and the Comprehensive Employment Training Act have, in many instances, brought about an improved education and industry relationship. This relationship, in most cases, has led not only to realistic and effective curriculum design but also to effective employment and placement channels.

However, growth and expansion can create problems. In many instances, the output of graduates has been disproportionate with respect to labor market needs. Further investigation has identified a need for improvement in planning and decision-making practices. A recent report on the role of federal assistance in vocational education concluded that much of the enrollment in federally supported vocational education courses has been concentrated in programs with only a peripheral relationship to labor market needs.[1] However, the report stated that enrollments in postsecondary programs, when contrasted with secondary programs, reflect some adjustment to the labor market conditions reported by the Department of Labor.

A 15-month study on youth and the meaning of work concluded that many students graduating from selected Pennsylvania colleges and universities feel inadequately prepared for the job market.[2] Its primary conclusion was, "Many students do not believe that they are leaving college with critical or unique job skills." Further, most students received little, if any, data which would enable them to find the kind of work they wanted or alternative jobs should there be limited openings in the labor market. Stated in another way, students felt they were making career choices at a time when they had little real information about the job market and career alternatives.

Responses to this need have been most evident in the past five years. The emphasis on career education, career awareness, career development, community learning and so forth, has brought about a plethora of federal, state and local programs aimed at improving the types and flow of occupational information for individuals in the process of occupational exploration, planning and decision-making. However, particularly at the postsecondary level or the college and university level, people are questioning the use of occupational information for certain purposes. Specifically, there is a continuing debate over the two basic program planning approaches. The first is the manpower-requirements approach, wherein program offerings are geared to labor market needs, and, second is the free-choice

approach, which emphasizes that program offerings be dictated primarily by student choice without regard to the occupational supply/demand concept.

In assessing the 1966 Pennsylvania Master Plan for Higher Education, Eric Walker (1966) stated, "The biggest change I would have made would have been to examine the needs of the state for trained people so that we could assist the industry which eventually will be called upon to pay the taxes for a large part of our educational enterprise."[3] A somewhat opposite viewpoint is offered by his successor. In an address at the Sixth General Conference of the International Association of Universities, John W. Oswald, president of The Pennsylvania State University, indicated that long-range educational planning to meet America's manpower needs is largely futile, partly because of the dynamic nature of the economy. He said, "We continue to believe that free choice of individuals and diversity of approaches to education are basically efficient."[4]

Although Oswald's statement cannot be called representative of all four-year colleges and universities, it certainly represents a significant number. This can be somewhat supported by the 1973 report by the Carnegie Commission on Higher Education, Graduates and Jobs: Adjusting to a New Labor Market Situation. The commission advised colleges and universities to avoid "manpower planning" such as restricting enrollments, opportunities or the availability of financial aid. The commission pointed out that American college students have traditionally been able to adjust rapidly to shifts in manpower demands. In the same report, however, the commission advised young people facing the decision of whether to go to college to:

- make the decision carefully, weighing alternatives that can lead to satisfying and rewarding careers;
- seek broad training in college instead of specializing, unless, of course, there is one overriding career objective to be reached;
- choose a career carefully;
- take a break between high school and college or between semesters in college to try out possible career interests or get experience that will help in the later job hunt; and
- be realistic about the future earning potential and job opportunities that college can bring.

Although there are divergent views on the role of labor market information in educational program planning, there is a consensus that such information, if developed in the right form at the right time, can be extremely beneficial. However, the right form at the right time is a puzzling phenomenon being debated by many educators, counselors, manpower specialists and labor economists. Certainly, the students' views as to their need for valid information about the job market and career alternatives should cause the most extreme college or university type who advocates a free-choice approach to at least consider the information relevant to the needs of the students. Even the most severe critics of the manpower-requirements approach concede that certain labor market information is valuable to the student who is in the process of setting a career goal or deciding on an educational program to aid in supporting the career objective. Bowen (1973) states that education is not designed to prepare people to do whatever work flows from the blind and predestined imperative of technology; however,

he believes students should have reliable information on labor market conditions and vocational options. But the types of data and information remain a question mark for many.

There have been a number of efforts in the past decade to eradicate the dilemma of no data and poor data. The result of these efforts would be to have reliable and valid occupational information for use by planners, youths and adults in a career planning and decision-making stage. It seems clear that individuals involved in economic or human resource planning, specifically economists, manpower specialists or educational administrators, have common needs either as producers or consumers of labor market data and information.

A significant problem which has existed for some time and probably will continue to exist is communications between data users and data producers. With the changing economic situation and the failure of many youths and young adults to obtain satisfying employment, the producers of data have had greater demands on them. These demands have been not only for more reliable and valid data but for information in specialized forms.

Within the past few years, the many agencies and individuals responsible for providing occupational information have expanded their efforts. However, there still is a need to improve and expand efforts in collecting and analyzing occupational data and information. Further defined, there has been too little or no communications between those who generate the occupational data, those who process it into usable forms and those who use it for planning programs or career decision-making.

It was the position of the agencies responsible for this symposium (namely, the Pennsylvania State Board of Education; the U.S. Department of Labor, Region III; and the Pennsylvania Department of Education) that by sponsoring a symposium wherein the producers and users of occupational data/information could interact, the impetus for improvement in generating and using such information could be developed.

The program sessions focused on labor market data and methodology, manpower research for vocational education (less than the baccalaureate degree) and manpower research for higher education (vocational, professional). The participants included state and local government, economic and human resources planners, educational administrators and planners from both higher and basic education, the CETA manpower planning council and services representatives, the U.S. Department of Labor and education representatives, guidance personnel and placement specialists from secondary and postsecondary institutions.

By bringing together these individuals working on manpower research at the national, regional, state and local levels, we hoped to bring about better communication, improve data and information, to help prevent duplication of effort and to explore the development of collective efforts rather than separate ones in isolation.

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I. Summary

Very few people, if any, can predict future conditions with exactness or in absolute terms. But this does not negate the need to make such attempts. A very succinct set of statements by Alvin Toffler (1970) in his book Future Shock sets the stage for the relevancy of manpower research and information:

> Only when decisionmakers are armed with better forecasts of future events, where by successive approximations we increase the accuracy of forecasts, will our attempts to manage change improve perceptibly. For reasonably accurate assumptions about the future are a precondition for understanding the potential consequences of our own action. And without such understanding the management of change is impossible (p. 416).

Objectives and Procedures

The general aim of the symposium was to address specific issues regarding the area of manpower research. The extent to which past efforts have focused on these issues may be characterized by Mark Twain's comment about the weather. He stated, "Everybody talks about it, but nobody does anything about it." With this in mind specific objectives were delineated.

A major purpose of the symposium was to improve communications between individuals and federal, state and local agencies which generate or use manpower research for program planning and decision-making. The theme "Research and Information on Employment and Training: Local, State and Federal Communications, Results and Utilization" focused on issues which individuals considered relevant to planning and decision-making in economics and education.

The agenda was designed to attract a representative number of participants to each of the group sessions. Following the presentations, selected discussants reacted to each topic; this was followed by an audience question-and-answer period. Keynote speeches were given at three general sessions: the first, to open and set the tone of the symposium; the second, to outline and begin the concurrent group sessions and the third, to summarize, highlight and offer future directions. This format was intended to provide continuity and stimulate dialogue on the symposium topics.

Three concurrent group sessions were held: one focused on "Labor Market Data and Methodology," another dealt with "Manpower Research and Information for Vocational Education (Less than Baccalaureate Degree)" and a third addressed "Manpower Research and Information for Higher Education (Vocational, Profession)."

By including individuals from different agencies but with common interests in manpower research, we hoped to foster a cooperative atmosphere in defining future needs and efforts. Another objective was to improve the awareness of the scope of manpower research and information. There was also a desire to encourage the development of feedback from users to producers of manpower data and information and possibly to improve the reliability and validity of data and information.

Highlights of Major Presentations

In the opening general session David W. Hornbeck, the Pennsylvania executive deputy secretary of education, stated that the declining resources of our present economic posture make it imperative to begin to shift resources from one area to another. He added that we are using the same number of dollars for more purposes. This has resulted in a focus on a manpower definition, and the kind of research underlying this definition becomes evermore apparent. His emphasis on the fact that the leadership role of the Department of Education depends on a better definition of where we are and where we are going supported the need for this type of symposium.

Following Hornbeck in welcoming the symposium participants was Frederick L. Bauer, associate assistant regional director of the U.S. Department of Labor, Region III. In summarizing the Bureau of Labor Statistics position as a data generator, he cited the need for improved communications and, in some instances, the opening of communication channels among various local, state and federal agencies. This, he emphasized, would benefit both the producers of data and the consumers.

The first general session was intended to set the tone for the symposium by focusing on critical issues in vocational education at both the secondary and postsecondary levels. Leonard A. Lecht's presentation, "Implications of Changes in Occupational Characteristics in the Next Decade for Planning in Occupational Education," and Stephen P. Dresch's presentation, "Higher Education and Vocationalism," provided data and information emphasizing the need for those involved in planning for education and training programs, at both the secondary and postsecondary levels, to view the economic and demographic changes within a manpower and social context at both the micro and macro levels of our society. Put another way, the talks reflected that individuals cannot view problems with limited or narrowly defined information when the problem demands broad and integrated information and its subsequent analysis.

Lecht's presentation emphasized the need for projections and estimates of the future for planning in vocational education. He highlighted the point that manpower information is only one ingredient in educational planning and that student interest is at least as important. However, he stated that no one, to his knowledge, has yet found a way to get a perfect match of all of these elements.

In discussing valuable labor market data and information, he emphasized a number of points. Information on earnings is considered as important as job opportunities in planning programs. Analyzing certain data, he made the observation that the projections for women and nonwhites point to an imbalance between our society's equal employment objectives and what has been happening in the labor market. He further adds that if the trends of the past 10 or 15 years continue, widely held expectations of upgrading opportunities for these groups will often be frustrated. On the role of vocational education in reducing the gap in equal employment opportunity for women or nonwhites, he offers two suggestions: one is to provide occupational information, counseling and guidance; another is to produce changes in enrollments by sex or race in vocational education courses.

Finally, in addressing one of the areas where growth in vocational education, both in quantity and quality, could be impressive, he cites adult vocational education. Here he indicates the need for a closer approximation to "lifetime learning."

Addressing "Higher Education and Vocationalism," Stephen P. Dresch focused on a sense of crisis in higher education which, he points out, has been a topic of conversation since the late 1960s. He stated that over and above the financial crisis, there is one which focuses on the instability of the fundamental relationships between higher education and the rest of society. Further, he emphasized the recent statistics which indicate a substantial drop in the college entrance rates of white male high school graduates. Significantly, recent studies point out that these declines in rates of college entrance could be explained by the education-related earnings differentials that have decreased markedly since 1969.

Addressing the concept of a changing social environment, of which education is a part, he emphasized that institutions must accept the fact that what was ideal for an era of excess demand for highly educated labor may not be ideal under emerging conditions of a persistent saturation of the highly educated labor market. With this thought he states:

> "From this perspective the question of vocationalism in higher education, as it is usually framed, misses the point. The fundamental issue is not the normative one of whether higher education should in some abstract sense be vocational, but involves rather such positive questions as: what are functions (vocational and other) of higher education, how have these functions changed in the past, and are there forces which will serve, directly or indirectly, to alter these functions in the future? Only by explicitly confronting these questions will it be possible to meaningfully address the normative issues of what higher education should be about and of how it should relate to other social institutions and even hope to emerge with action-oriented conclusions of relevance to policy."

A discussion of career decision-making and its critical relationship to educational decision-making is offered. Dresch cites the need for a meaningful analysis and specifies that the analysis must include labor market conditions, the relationship and meaning of these conditions to an individual's perceptions, and the evaluation of these perceptions as they relate to the individual's educational, social, personal and economic characteristics. He states that there is demonstrated evidence of the absence of serious attempts to understand the forces operating to alter the environment within which social institutions exist and hence to alter the very nature of these institutions themselves.

Concluding, he reiterates a critical need for a more in-depth understanding of the individual career development process and the evolving social and economic environment. He further states, in guessing terms, that for the next two decades not only higher education but also the entire educational system will experience traumatic times.

In a keynote address John C. Pittenger, Pennsylvania Secretary of Education, commented on the topic, "Relationship between the World of Education and the World of Work."

He expressed the belief that in the next decade or so there is more likely to be a problem of underemployment than a problem of unemployment. Emphasis was placed on the concern that the expectations expressed by baccalaureate degree graduates and high school graduates will not be met in the

next decade, given the present and future economic scenario. Already there is evidence that a number of people are overqualified for their jobs.

In discussing the phenomenon of educational degrees, he said we must stop saying that a baccalaureate degree will produce a lifetime income of X number of dollars more than the average high school graduate's income. Supporting information for Pittenger's comment appeared in an article from the September issue of Change magazine, in which Richard Freeman and Herbert Holloman stated, "As a result of the decline in relative incomes and starting salaries and in the face of continued increases in tuition and fees, the rate of return on the college investment has fallen significantly. According to one set of estimates, the return dropped from 11 to 12 per cent in 1969 to 7 to 8 per cent in 1974. A decrease of this magnitude is unprecedented." (Change, September 1975, p. 25). This issue was discussed in Stephen P. Dresch's paper and was a topic of conversation throughout the symposium.

Pittenger highlighted other issues such as the need for industry to change the work environment or the nature of work itself so that it is more satisfying than it apparently has been under conditions of mass production.

In discussing the problem of credentialism, wherein job requirements on paper often do not reflect the genuine requirements of the job itself, he warned that in the type of society we are moving into, where people are looking for jobs that don't exist, the temptation might be to go on increasing credential requirements for jobs.

Finally, he expressed concern that, in the rush to avoid unemployment, we might well define salable skills so narrowly that in the long run we will have contributed to the problem rather than solved it. An alternative suggestion was that there are other aims of education besides the monetary one, however valuable that may be. His proposal was that we ought to take a broad view of what we are training people to do. Specifically, he suggested that we train people to hold down a cluster of related jobs and not a single niche that may easily become obsolete. Pittenger also said we must keep an open educational system. Elaborating on the open educational system he stated that since we live in the kind of world where your education is never finished, we need to work out ways in which all ages, sexes, and racial groups can come back to the educational system full time or part time for short periods and long. This view paralleled Lecht's concept of converting adult vocational education into a closer approximation to lifetime learning.

In the second general session Seymour L. Wolfbein, dean of the School of Business Administration at Temple University, provided the orientation for the major group sessions which followed. He opened by reading an article from The New York Times by Russell Baker, entitled "Hudson High Carries On." The article, certainly relevant to the conference theme, highlighted the plight of high school graduates in the depressed job market. It also covered the impact of occupational information on individuals planning to enter the job market or those involved in the career decision-making process.

Wolfbein emphasized that discussions would center around labor market information and data collection or curricula and all the other plans, programs, techniques and devices of a total educational and training system. Moreover, he added that attention would be directed towards a definition of objectives addressing education, training, guidance or preparing labor market information. As the participants take part in the proceedings, he suggested they ask them-

selves whether the sessions covered three items. First, "Do the objectives relate to a process which will enable individuals to take advantage of inevitable changes in the relationship between what individuals learn and what they are called upon to do?" Secondly, "Isn't the primary objective the presentation of an inventory from which individuals can maximize their choices?" The third and final point was, "How can we improve what we are doing in this particular field?"

Finally, Wolfbein stated that a real contribution could be made if we make it clear that we are trying to help people in their long-term careers by offering them information and curricula to maximize their choices.

The first concurrent group session focused on "Labor Market Data and Methodology." Three topics were presented: "Occupational Employment Statistics Program," "Occupational Projections Methodology" and "Occupational Supply: Past, Present and Future."

The first topic, "Occupational Employment Statistics Program," was presented by Myron H. Levine, chief of the Branch of Occupational Projections, Region III, Bureau of Labor Statistics. He described a system developed by the Bureau of Labor Statistics in the U.S. Department of Labor. This system represents the bureau's approach to developing a comprehensive manpower information system capable of gathering, storing, integrating and disseminating information on manpower demand and supply by industry and by occupation. The primary importance of the system is to meet the specific informational needs of not only the state but the economic subdivisions of the state.

Briefly, the program has three distinct components: (1) survey operation, (2) industry-occupational matrix, (3) projections. With this system, data can be generated to assist decision-makers and planners in (1) justifying training programs, (2) structuring training programs, (3) comparing skilled worker demand with training programs, (4) studying program feasibility, (5) making management decisions and (6) career guidance and counseling.

In summary, Levine stated that the ultimate goal of the system is to make the most efficient use of financial and human resources. Further, the system is structured to help planners, educators, guidance counselors and representatives of private industry to intelligently make their way into the future with respect to changes in manpower requirements.

The second presentation on "Occupational Projections Methodology" was given by Joseph S. Cangialosi, labor economist at the U.S. Office of Bureau of Labor Statistics. He provided a historical overview of the evolution of the Bureau of Labor Statistics' occupational projection methodology. Because of the inadequacies of the area skill survey program and the resulting recommendation in 1968 by the Advisory Committee on Research to the U.S. Employment Services, the BLS initiated experiments to test the feasibility of its occupation matrix as a method of forecasting statewide demand in large local labor markets. This work resulted in a publication describing an occupational projection methodology. This publication, Tomorrow's Manpower Needs, and the series of reports which followed it filled a void in labor market information.

Cangialosi indicated that the industry-occupational employment matrix has, for over a decade, been a principal tool in the preparation of national projections of occupational employment. Specifically, the preparation of occupational projections through a "matrix approach" requires two basic inputs,

namely, a set of industry-occupational staffing patterns for a target year and a corresponding set of industry employment projections.

The two basic methods of preparing occupational projections (Method A and Method B) were described. Method A results in area projections developed within the context of national economic and technological trends. It uses two factors believed to be most important in estimating occupational growth--industry growth or decline, and shifting patterns of occupational employment within industries. Method B requires the development of a special state (area) base period industry-occupation matrix.

In addition to explaining the procedures for projecting occupational employment, Cangialosi defined the methodology for estimating occupational replacements. This refers to workers who die, retire or leave the labor force for other reasons. He stated that for the nation as a whole, from 1972 to 1983, about two-thirds of all new entrants to the labor force will be needed to replace workers who die, retire or leave the labor force for other reasons.

The final presentation for the first session dealt with "Occupational Supply: Past, Present and Future." This topic was presented by Neal H. Rosenthal, assistant chief of the Bureau of Labor Statistics, U.S. Office. He stated that the concept of supply is very difficult and much more complex than the concept of demand, but he indicated that very little work has been done in this area. In describing the Bureau of Labor Statistics' program in 1976, he indicated that the BLS will probably be devoting more effort to studies of supply. Primarily, the bureau will be trying to fill in some basic data gaps rather than trying to understand market conditions. Specifically, the BLS will be looking at all factors affecting the flow of workers into and out of an occupation (for example, the output of institutional training programs and where graduates go in regards to the occupational pattern). Rosenthal stated that other areas of investigation will include the outputs of employer training programs and regular apprenticeship programs, and occupational mobility within and between occupations. Additionally, transfers into the labor force from programs or groups not previously mentioned will be analyzed in-depth.

In summary Rosenthal stated that much has been outlined and a number of areas of study begun; however, we really don't know how they are going to turn out. He emphasized that, as in all programs, the financial and human resources to accomplish the objectives change over time even though many things need to be done and can be done.

The second concurrent group session focused on "Manpower Research and Information for Vocational Education (Less than the Baccalaureate Degree)." The first presentation was a report on the "National Longitudinal Study of the High School Class of 1972." Kenneth A. Tabler, project director, National Center for Educational Statistics, U.S. Office of Education, presented this topic. He stated that the purpose of study was to find out what happens to high school seniors after they graduate or leave high school. Presently, the researchers are looking into the education, job training and vocational histories of the national probability sample of 23,000 students. Specifically, Tabler stated that the study will provide data on how career patterns and aspirations develop and persist over time; the characteristics and abilities of those who pursue various kinds of postsecondary education; occupations; the impact of federal funds and programs and how well educational experiences have prepared youth for work.

The following are selected findings of the efforts to date. In the spring of 1972, students were asked what they planned to do the first year after they were out of high school. The results indicated about 59 per cent planned to attend some kind of postsecondary institution, 25 per cent were going to work full time and 2 per cent were going to work part time. In following up the same students in October 1972 and October 1973 the percentages were as follow: 30 per cent of them actually attended a four-year college. Those attending vocational technical trade schools amounted to 8 per cent and then dropped off to 5 per cent in October 1973. Those working full time amounted to approximately 30 per cent in October 1972 and increased to 39 per cent in 1973.

In examining the students' occupational choices upon leaving school the following was indicated: 44 per cent were planning to enter the professional area, 15 per cent clerical, 7 per cent crafts, 7 per cent technical, 4 per cent service, 3 per cent managerial, etc.

In examining occupational plans by curriculum of preparation, it was found that most of the students who planned to work actually did; then it increased slightly. In asking students how they perceived specialized high school training which was intended to prepare them for immediate employment, it was found that 59 per cent worked in jobs where they expected to use the training, 16 per cent looked for such work but couldn't find it and 25 per cent never looked for work where they could use the training. Of those who worked on jobs in areas where they expected to use their training, 71 per cent said they were able to apply the basic principles, 32 per cent said they could have gotten a job without the training, 88 per cent considered the training a wise choice, 32 per cent would've liked more information about what was expected in the job beyond skilled training.

Tabler stated that the next follow-up is expected to commence in October 1976. He indicated that this time information will be available from those who have completed a four-year college program and those who have embarked upon a career right after high school. Further, he stated that a fourth follow-up will probably be conducted in 1978 and a fifth in 1980.

The second presentation, given by Michael J. Pilot, coordinator of the Occupational Outlook Handbook, Bureau of Labor Statistics, U.S. Office, focused on the "Supply/Demand of Allied Health Occupations." Pilot said the health services industry has been one of the nation's rapidly growing areas. He indicated that the 1974 employment of about 516 million was twice the 1960 level. Further, he stated that by 1985 there could be as many as 9 million workers in the health industry.

Pilot believes most of the additional growth will be outside the hospital sector. He stated that the delivery of health care services is turning away from in-patient care, and we have seen much growth in out-patient clinics.

Although the health industry overall is going to be a rapid growth area, there will be a range of supply/demand conditions in the selected occupations. Some job opportunities will be excellent while others will be highly competitive.

In summary, Pilot stated that increasingly in the future individuals will need to thoroughly scrutinize supply/demand data to determine the critical need areas. Finally, a monitoring of supply from all inputs will be essential to provide programs, services and people to meet the health care needs in the present and future.

The third paper, presented by Glenn C. Boerrigter, director of the Vocational Research Branch, U.S. Office of Education, outlined various Office of Education supported projects in "Manpower Information Systems for Program Planning."

He indicated that in 1974 manpower information and systems was one of the five priority areas that Part C of the Vocational Education Act supported as a funding area. Primarily the projects were state-oriented. He gave examples of certain state projects such as that in Texas, which will provide supply/demand statistics in groups of 250,000 people and also at the county level. In the state of Washington, federal and state forecasting information will be translated for use at the local level. In South Carolina the focus is on matching job requirements and training skills with an emphasis on using manpower forecasts in curriculum development. In Tennessee attempts are being made to build a regional system of manpower supply, demand and other related factors for vocational technical education.

In addressing the need for a manpower requirements approach to vocational education planning at the secondary level, Boerrigter indicated a serious need but stated the problems of identifying the relevant information and putting it in a form which local planners can understand and trust is a difficult task.

The third concurrent group session focused on "Manpower Research and Information for Higher Education (Vocational, Professional)."

"A Supply/Demand Study of Engineering Occupations" was presented by George E. Brehman, research associate at the Pennsylvania Department of Education. He indicated that the study's objective was to determine the supply/demand picture for baccalaureate degree engineers in Pennsylvania from 1975 to 1983. He noted that his study reveals a current (1975) shortage for all types of engineers and a considerable long-term shortage until 1983 because of Pennsylvania's probable response to the energy crisis. The greatest need, numerically, will be for more electrical-electronics engineers, mechanical engineers, industrial engineers and chemical engineers than will probably graduate between 1975 and 1983.

In addition, he noted that there will be a marked increase in demand for highly specialized types of engineers, especially those related to nuclear power generation and energy production and those needed to improve health services and food production (e.g., biomedical, health systems, aquaculture and mining).

His comments on the limitations and assumptions upon which his projections were based emphasized the need for the data user to be informed rather then use projections in a blind fashion.

Brehman concluded by citing the overall need as a problem of recruiting rather than a lack of facilities to train engineers. What is needed is an adequate number of students to meet the projected needs despite a possible period of declining interest in science and engineering along with a continued decline in mathematical aptitude and science achievement scores.

The second presentation, "Career Plans and Employment Outcomes of College Graduates," was given by Jean G. Kessler, administrative coordinator and managing editor, College Placement Council. Kessler described certain research which the College Placement Council and its related organization, the CPC Foundation,

funded in the area of career plans and employment outcomes of college graduates. Specifically, she outlined the findings and some of the implications for educational decision-making.

Citing the data bank developed by the Research Division of the American Council on Education, she stated that the project personnel were able to use data obtained from a questionnaire administered each year to freshmen at about 300 institutions selected on the basis of a stratified sampling design. The overall focus was on follow-up surveys of those graduates who had responded to 1961 and 1966 freshmen surveys. These data were investigated in terms of the career plans of these two college classes, with analyses covering the shifts in career plans from the freshmen to the senior year and the actual initial employment outcome. Differences between the two classes were also examined.

As a result of these studies, three monographs will be prepared. The first reviews the career development and employment outcomes of the 1961 freshmen, many of whom had been working since graduation in 1965. The second will focus on the career outcomes of the liberal arts graduates in this cohort and will compare them with those in nonliberal arts fields. The third will discuss the career patterns of men and women who took employment in private companies as compared with those in other settings.

The following selected results and conclusions were presented. The responses of the 1965 and 1970 graduates showed suprisingly similar career plans. Further, freshmen's career plans were found to be good predictors of senior-year outcomes, although considerable shifting occurred during the college years.

The 1974 follow-up focused primarily on the usefulness of education in employment. Preliminary findings indicate that more than half the class chose their career either at graduation or in subsequent years. Approximately 58 per cent reported that college was only somewhat or not at all helpful in providing a skill that enabled them to get their first job, but almost all felt that it increased to some extent their chances of finding a good job. Respondents were asked to judge whether their jobs are "closely, somewhat, or not at all related" to their majors. Almost half (46 per cent) considered their major and job "closely related," 27 per cent said "somewhat," and 26 per cent said "not at all." The highest proportion of graduates who perceived their jobs to be closely related to their majors was observed for vocational fields--the lowest was for liberal fields. Another factor examined was job satisfaction. The researchers found that it is not the extent to which college education is related to jobs but the reason for lack of relatedness that makes the difference. Based on the study data, it would be reasonable to expect increasing dissatisfaction among college-educated workers so long as the job market is unfavorable.

Based on the 1974 survey, she indicated, that much education is not being used in careers. Further, she said that people assess the value of their college education in many different ways, but its usefulness in career development is one of the most important. These studies also indicate that people assess the relatedness of education and employment more on the basis of their perception that their majors are being used in their careers than on the basis of any literal match between the two.

In summary, she suggests a need for change in career planning and in the traditional approach in choosing an undergraduate major. The more educa-

tors and counselors know about the relationship between education and employment, the better equipped they will be to help students make viable choices or at least understand the implications of their choices for their future development.

The third presentation, by William E. Toombs, assistant director of the Center for Higher Education at The Pennsylvania State University, focused on the topic "First Year Out: Delayed Entry Decision." This was described as an exploratory study of the process of adjusting to what can be called "delayed entry into the labor force." Moreover, it was an examination of the relationship between a person's education and career choice. He states that at the moment and, for most of the next decade, the process of entry into the labor force is likely to be as significant as the process of vocational choice.

Data were collected from a questionnaire mailed to a sample of liberal arts graduates who received baccalaureate degrees from Pennsylvania institutions in 1973. Certain tentative conclusions were that the orientation of educational practice toward the problem of entry into the labor market emphasizes the selection of, and preparation for, career options that are as specific as possible. He states that an alternative lies in more flexibility in the job search process. In this view, graduates, as individuals, would search across the available job market until they encountered an opportunity for which they were ready to trade off undesirable aspects for good features. However, the data reveals, in general, a poorly developed sense of search strategy, and the range of sources for information is narrow and highly personalized.

He recommends that program planners in the liberal arts could offer their senior-year students a range of search strategies that emphasizes how to develop new information and contacts and how to translate that information into program action.

The fourth and final paper for this session was "Higher Education Program Planning and Manpower Research: Yes or No?" presented by Robert D. Newton, associate director of Information Systems, Office of Budget and Planning, The Pennsylvania State University.

Claiming that an association of manpower research with educational planning frequently invokes controversy, he cites two basic criteria as a cause for the controversy. One is that the application of manpower planning in a democratic society will lead ultimately to a situation where the individual will be deprived of a free choice in the selection of a career. The second concerns the accuracy of the manpower forecasts.

Citing the Bureau of Labor Statistics projections of the U.S. economy to 1985, he notes a sharp slowdown in overall economic growth and a potential oversupply of college graduates, both of which will begin in the late 1970s. He makes the point that although this may not mean large-scale unemployment among college-trained personnel, it most certainly will result in underemployment--availability of jobs with skill demands less than capabilities--and a rise in the specificity of job requirements and credentialism. His observations are congruent with those expressed by Lecht, Dresch and others who indicate that probably the major problem for the highly educated and trained may not be unemployment but underemployment in future years.

Newton states that from his viewpoint, it is likely (given some reasonably accurate perspective of future occupational needs) that students will engage in a selective process which will provide a better balance and, at the

very least, will minimize the extremes of imbalance between manpower supply and demand than we are likely to have with continuance of an informational vacuum in this area. Further, he said that these informed choices, in the aggregate form, may be the basis for a potential impact of manpower forecasts on the educational planning process uniquely suited to the conditions of the next decade.

In summary, he responds to the question of whether higher education needs program planning and manpower research by saying that in the broad sense, yes. But adds that the research should focus on providing students with the basis for informed decisions on career choices, particularly in view of the employment prospectus of the decade ahead.

Janet L. Norwood, deputy commissioner, Office of Data Analysis, Bureau of Labor Statistics, U.S. Department of Labor, focused on "Occupational Projections for the 1980s." She emphasized that various Bureau of Labor Statistics programs should be interrelated with the people who are using the data. In other words, the producers and the users must work closely together.

She emphasized that manpower policy is very much dependent upon economic policy, educational policy and even social policy. Further she indicates that all planners in each of these areas needs to be cognizant of future scenarios. Emphasis was given to the fact that careful planning requires information. Information on the past, information on the present, and information on projections of what we might expect for the future.

Emphasis was given to the need for a series of basic assumptions which are carefully articulated in making projections. Adding that we must always remember that the projections are based on sets of assumptions and we know that the projections can only be as good as the assumptions upon which they are based. She stated that to the extent that these assumptions may prove wrong, and some of them certainly always will, then adjustments in the projections have to be made. Moreover, she added that the assumptions have to cover rather volatile areas, such as, How will our population grow? What is going to happen to the demographic or age profile of the labor force? How will the economy fair? What will production, consumption and social patterns be? To consider and account for assumptions and many variables she stated that the Bureau of Labor Statistics uses a great many projective techniques. These include input/output tables, occupational matrixes, growth models and analysis of technological trends.

One concludes that a primary concern as expressed in the presentation was the fact that any projection system must be flexible and must be constantly changing. Further, the users of these data systems must recognize that fact.

In summarizing the projections for the 1980s she offered the following. The labor force will grow but at a slower rate in the next decade compared to the past. The labor force will be older and this is extremely important. The 25 to 54 age groups in the labor force will increase. Women will continue to constitute a very important segment of the labor force. Specifically, in regard to occupations, there will be a continuation of the shift from goods producing to service industries. Employment of some occupational groups will increase faster than those for other major groups. Clerical worker jobs will probably continue to grow and some of the other occupations--sales workers, craft workers, operators--will continue to grow but at a slower rate. Perhaps the most important element of these projections is the fact that they appear to indicate that there will be a major shift in the supply and demand for college graduates by 1985, and in fact

have a surplus of well over 100,000 or 140,000 college graduates per year.

In conclusion, she stated that the decade of 1980s will clearly present very real challenges and that these challenges can only be met by joint efforts by situations in which people who are specialists in education, people who are specialists in employment and training, and people who are specialists in producing data, work together so that the users can indicate to the producer of data what are required. And the producers of data can be sure to explain fully to the users what the data means, what their limitations may be, what kind of improvements can be brought about and how they should be used.

In the final general session, two major presentations were given. The first by Mary N. Hilton, deputy director, Women's Bureau, U.S. Department of Labor, who addressed the topic "Women in the World of Work." She emphasized the importance of taking into account in any realistic forecasting, which would effect educational and manpower plans, the changing status of women workers and our national commitment to equal employment opportunity for women.

In reviewing certain statistics on women in the world of work, she cited the following. From a national viewpoint there were more than 36 million in the labor force in April of 1975. Presently, women account for close to 40 per cent of the labor force and since 1965 women have comprised nearly 60 per cent of the net growth in the labor force. Further, since mid-1960s, there has been an upsurge in the labor force participation among younger women. Accordingly, today the median age of women workers is 35 years as compared to 41 as recently as 1960. In 1974, 36 per cent of women with only preschool age children were in the labor force as were 33 per cent of mothers having both school-age and preschool youngsters.

She cited a basic problem in many cases is that our society still clings to old stereotypes, as the ways men work and the things women are permitted to do. And the result is that women continue to be concentrated in the lower paying, lower skilled jobs.

In discussing the role of the Women's Bureau she stated that its purpose is to promote the welfare of wage-earning women and to that end over a now 55-year history our task has been to educate, to provide technical assistance, to get out as much information as we can to help groups who are concerned with questions related to working women. One of the concerns mentioned was the need to encourage women into nontraditional jobs.

In conclusion she expressed the need for greater concern and for cooperative efforts to effect positive and productive results in bringing about an improved status of women in the work force and a commitment to support the equal employment opportunity for women.

The final presentation by Seymour L. Wolfbein summarized the deliberations which took place, commented from his experience in labor economics and related areas and offered recommendations for a future direction as it relates to manpower research.

A major point raised by Wolfbein was that throughout the symposium there was repeated expression of the need to define and elucidate the assumptions as they relate to the manpower area. He offered for consideration that the same group come back a year from now and evaluate their decisions and plans in light of this years' conference and then go back through their deliberations a year hence with an entirely new set of assumptions.

He then stated that as we begin the fourth quarter of the century there are a number of critically important and surpassingly important reversals occurring in this country. For example, he states in the first year of the fourth quarter of the century we had a significant reversal of form in productivity. The first year in which we really have seen the persistent, consistent, dramatic decline in output per man hour in this country. Further, he stated for the eighth consecutive quarter a very important decline in output per man hour in manufacturing, an enormous corresponding increase in unit labor costs, the biggest one since BLS began calculating the series of Post-World War II America. Another is in the increase in the service producing sector of the clerical and the professional occupations. A third reversal in form is arising; a very strong trend towards increasing employment and putting more and more of our concern for people with manual talent whether it be in the goods producing sector or servicing sector. A final concern is in the change in the geography of American industry. Also, the question was raised as to what if any, meaning is there in the way we provide for and deploy occupational information.

He concluded by saying that it would be interesting if we put all these things into focus and asked ourselves what does the future really hold for us.

Commentary

The purpose of this summary was to reiterate salient points and issues which were raised in the presentations and discussions which followed. To the extent that this was accomplished this editor bears full responsibility for the errors and omissions and commission.

In the following it is attempted to more concisely relate the significant issues which appeared to reflect major concerns and interests of the symposium participants.

First, there were a number of points raised in the group sessions with the practical or operational problems of information for planning. The most significant issue which was the focal point of the symposium was the need for improved communications between the data producer and the user. Further, it was stressed that the improved communications between these groups at the local, state and federal levels could assist in improving the reliability and validity of labor market data. Significantly, it was noted that there is an overwhelming need to provide technical assistance and improved policy guidelines for the user in his efforts to interpret and systematically use the data and information. Secondly, in sessions addressing the needs of those concerned with higher education and less than the baccalaureate degree programs the major concern was over the degree to which manpower research, specifically occupational supply/demand data, is or should be better focused on the potential student in the process of career planning and decision-making. Seemingly this in turn could lead to more responsible institutional program planning in regards to meeting both student interests and labor market needs. Additionally, whether the information be directed toward a student program planner or decision-making, a major concern should be on how the information should be presented and to what detail.

Evidence of support was given to need for continued but well-designed follow-up studies of graduates as they enter the labor market and pursue their career objectives. It was felt that this type of information can be extremely valuable if one first formulates certain hypotheses and then followed with a critical analyses of the data in light of the hypotheses. Further, that the resulting information be used in decision-making models.

Finally, in the keynote speeches and general sessions a number of significant points were raised.

First, it was felt that greater attention needs to be placed on development and following-up of stated assumptions about future social, economic, demographic, technological and political conditions. Moreover, it is the belief of many that the assumptions must be understood by the data user as well as the person generating the data.

Given certain projected data a second concern focused on the issue of present and future college enrollments and the problem of underemployment. It is offered that this may be more of a problem than the high rates of unemployment. Based on certain Bureau of Labor Statistics information it has been estimated that there may be an annual oversupply of 140,000 college graduates by 1980. Certainly one can expect that these graduates will be seeking other employment and it may well be in areas which do not require the amount of education which they possess. Therefore they will be competing with individuals having less training but who may well be equally qualified. Certainly this situation will lend itself to furthering the already severe problem of excess credentialism in the job market.

Finally, the present and future economic and demographic scenario leads many to believe that the educational system will experience traumatic times. There appears to be no easy solutions to the many problems of seemingly declining financial resources and demands for more accountability and improved services. Certainly individuals and for agencies concerned with the betterment of the education and training for all individuals must work not in isolation but in coordination and cooperation to use the same resources or in some instances less resources for more purposes to meet the needs of individuals as well as the community.

I

In the opening general session a number of points were presented focusing on the interrelationship of economic, demographic and educational changes. Discussion on how these variables affect occupational education at both the secondary and postsecondary level were highlighted.

Significance was attached to demographic and economic changes in explaining some of the manpower and educational planning problems. Issues focusing on the rapid population growth of the late 1950s and 1960s and the subsequent reversals of the 1970s and projected 1980s, along with concurrent economic changes, were presented around the educational and social responses of that time.

Various questions are raised as to the legitimacy of various programs and policy for meeting the needs of both the individual and the labor market. Traumatic times are forecast for the educational system based upon certain demographic and economic assumptions. In addition, certain alternative strategies and procedures are offered to cope with the ensuing conditions.

The summation of thinking reflects the need for a greater understanding of individual career development process and of the evolving social and economic environment than we now possess.

IMPLICATIONS OF CHANGES IN OCCUPATIONAL CHARACTERISTICS IN THE NEXT DECADE FOR PLANNING IN OCCUPATIONAL EDUCATION

Leonard A. Lecht*

I am here to discuss a study the Conference Board is undertaking for the U.S. Office of Education. The study is concerned with changes in occupational characteristics and what they imply for planning in vocational education.

As soon as we start talking about occupational characteristics and the labor market, we get into an area of what appears to be highly exotic and abstract numbers. Few would question that it is necessary to have projections and estimates about the future for planning in vocational education. But before looking at numbers, it would be wise to remember that manpower information is only one ingredient in planning in education, and that student interest is an ingredient at least of equal significance. No one to my knowledge has yet found a way by which one gets a perfect match of all of these elements. However, manpower information is important because vocational education is concerned with careers, and careers imply concern in terms of job openings and job opportunities. We train people now for the jobs that will be available presumably five, 10 and 20 years from now.

I have distributed some tables, and the first of these are simply projections of job openings (see Table 1). They are not new because we have borrowed them from Neal Rosenthal's shop in the Bureau of Labor Statistics office. So whatever value those numbers have, the credit belongs to the Bureau of Labor Statistics. In this study we have been concerned with nearly 125 occupations. These are the occupations which are related to existing vocational courses, or they offer good potential for vocational programs and, therefore, are of primary interest to vocational education. Most of the people in these occupations do not have college degrees. For another consideration, they imply some degree of skill. Skill acquired in a formal training course or on the job. The standard emphasis in vocational education planning has been on job openings. How many jobs will there be, are we training too many people for individual occupations, are we training insufficient numbers of people, and so forth. These are certainly important questions, but they are only part of the manpower considerations that are significant in looking ahead in vocational education.

The earnings' levels in the jobs for which we are training people are also an important question. To put it more positively, how can we train people not only for jobs but also for careers that offer a livelihood. A related question grows out of the social turmoil and social changes we have had in the U.S. in the past five or 10 years. This concerns job opportunities for blacks or what the Census call nonwhite, and job opportunities for women. What is the vocational education system doing to expand opportunities for both these groups? And then we might add another manpower-related question. What is happening to educational attainment in the occupations for which we are training people? Are we training people for jobs in which the competition of college graduates will be much greater 10 years from now than it has been today? Or are we training people for jobs in which educational credentials will be more significant than they were a while back?

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To look at these briefly, the 125-odd occupations we have here account for about 80 per cent of all the vocational education enrollments. The types of job openings included are consistent with what has often been referred to as the movement toward a postindustrial society. What the data show is rapid growth in service occupations. Rapid growth is also evident in many white collar occupations, especially in the professional and technical fields. Growth is less rapid in numbers of craft and technical occupations. Least growth, actually decline, is projected for the farm occupations and little or no growth for unskilled labor. The story these projections of job openings tell is not new but it can be useful. One of its uses is to compare the projections of job openings with the anticipated enrollments in vocational education. We have done this on a national basis in Table 2. In Table 2, we have compared the Office of Education's national projections of the distribution of vocational education enrollments in 1977 with the projected annual distribution of annual average job openings for the overall 1970 to 1985 period.

I am sure you have seen figures similar to these in the past. While they are not new they raise some interesting questions. One of them that has been raised several times before involves the field of agriculture. This is the one major field in the economy in which employment is very likely to decline and has been declining for some time. Currently, enrollment in the agricultural programs has been growing less rapidly than in many other fields but, according to the Office of Education estimates, it is still expected to account for between eight and nine per cent of the vocational educational enrollments, yet, agriculture is expected to account for only about one per cent of the job openings. Many people point out that the relevant comparison is with job openings in the broad field known as agribusiness. We have gone through the occupations related to agriculture. Including these occupations raises the projections of job openings a bit more than a half of one per cent to about one and one-half per cent. Including the agribusiness fields does add to the job openings projections but it still leaves what at least on the surface looks like an imbalance. What is one to make of this imbalance? I have no definite answers. But one clue is that we have oversold vocational programs in agriculture as occupational education. The rationale for vocational education, especially at the federal level, has been that it prepares people for jobs. Frequently, the way to get accepted and the way to get support in vocational education has been to say you are training people for jobs. Now, to a considerable extent, that is true. But here are many worthwhile things in this society that are only indirectly related to jobs that may have other social values. We recognize this in consumer courses where we distinguish between what we call gainful home economics and other home economics. My private feeling is that it would make sense to do that in agriculture as well. We would recognize that one part of agriculture, the aspects concerned with agricultural technology, the uses of equipment, etc., is career training. We would also recognize that much of the agricultural programs is useful background for many things in life but it is not closely related to preparation for any specific occupation.

As we look at the field of distributive education we find that the job openings are relatively more numerous than vocational education enrollments. This raises many questions about the possibilities of increasing those enrollments. In the health field, vocational education enrollments have grown rapidly. However, they are proportionately still something less than the job openings. But it must also be considered that other sources of training exist for the health occupations in addition to the vocational education programs. The story is roughly similar in the office occupations, while there is a higher proportion of enrollments than job openings in technical occupations.

Trade and industrial has somewhat more, but vocational education is a pretty important supplier in these fields. Overall, thinking in terms of increasing the career options available to young people, no identical balance need be expected between enrollments and job openings. However, the imbalance in agriculture should be faced as a problem.

Another problem for planning arises from the change in educational attainment in the U.S. We have looked at the changes in educational attainment by occupation for the overall population. Then we have looked at the under 35 group separately, because most of the changes take place in the younger age group who make up the newer entrants in the labor market. The projections show that college graduates will probably be competing with vocational graduates, and particularly postsecondary vocational graduates, in a number of fields. That is, as the supply of college graduates increases, and as it becomes harder to get jobs as teachers, more graduates will be entering other white-collar fields, especially clerical and administrative fields. They will probably also be entering health technologies in larger numbers, and many of the better paying service occupations. But the more far-reaching change in educational attainment is expected at the other end of the educational ladder. Twenty years ago blue-collar workers and the less skilled workers generally had eight, nine or 10 years of schooling. Currently, the proportion of people with 12 years of schooling in these occupations has become far more substantial. Accordingly, high school vocational education directed towards employment in the less skilled fields will be largely education for high school graduates in the next 10 years.

Earnings data are also important for planning in vocational education (see Table 3). We have prepared both historical data and projections dealing with earnings but we have paid primary attention to the historical data. The earnings data refer to the occupations which provide the focus for our study. About four-fifths of the enrollment in vocational programs relates to these occupations. Looking at the distribution of earnings in these occupations, the fact that vocational education is primarily concentrated in occupations which are in the lower middle end of the earnings distribution. Now the earnings figures refer to the earnings of full-time year-round workers in these occupations. Close to two-thirds of the people employed in these occupations earned less than the median for all full-year workers in 1970 or less than $9,945 (in 1973 dollars). More than two-fifths earned less than $8,000 a year in 1970, which is considerably less than the median. Fewer people are employed in the better paying occupations for which vocational education frequently offers training, say those paying $42,000 a year or more. Increasing the program offerings and enrollments in these better paying jobs can provide an important objective for vocational education in the next five or 10 years. For example, there are some jobs for which vocational education offers preparation which are in the $16,000 to $18,000 bracket. These occupations include some semiprofessional and technical fields and some management positions. They also include occupations in the finance and real estate field.

In the past, some of the vocational education courses probably trained people for jobs in the bottom quarter or bottom fifth of the earnings distribution. For example, in 1966 or 1967 one heard a great deal in Washington about new careers as fields for vocational education. These were careers as teachers aides, health aides and in other professional human service occupations. Interest in these fields often stemmed from the war on poverty approach.

It was felt that the new career positions could offer jobs for people in the central cities who had a good deal of experience of living and native wit, but little formal schooling. A sizeable number of people were trained in these fields before the problems became apparent. For one consideration, they generally paid badly. For another, in practice, there were few channels for moving up the career ladder into better jobs. A third was that these positions provided very little job security and they often provided few fringe benefits. The new careers movement has lost most of its steam, probably, in good part, for these reasons. The point in citing the new careers experience is that earnings are just as important in planning in the light of manpower information as are job opportunities.

Our study has focussed on the changes in job opportunities for women and nonwhites. It is said that fools rush in where angels dare to tread. And projections of job openings for women and nonwhites to some extent have that characteristic. However, they have a few saving graces. For one thing, most women and most nonwhites who will be in the labor force in the 1980s are already in it. And while they may frequently change their jobs, they are unlikely to radically change their occupation.

The projections for women and nonwhites point to an imbalance between our society's equal employment objectives and what has been happening in the labor market. They suggest that, if the trends of the past 10 or 15 years continue, widely held expectations of upgrading in opportunities for these groups will often be frustrated. The projections show evidence of change in the occupational distribution for women and nonwhites, but most of the anticipated changes are modest. Most of their employment would be in the fields in which nonwhites and women have traditionally been employed. For women in nonprofessional fields, these would be the various health-related occupations, or secretarial and related occupations, or as assemblers or hairdressers. For nonwhites, the concentrations would occur in less skilled and less paying occupations.

Our data show the distributions of employment by sex and race in these 125 occupations in 1970 and 1980 and the distribution of employment by earnings for full-year workers (see Tables 4 and 5). In 1970, three-fourths of all women in these occupations were employed in jobs which paid less than $8,000 a year. Less than one-fourth of the men were employed in jobs which paid less than $8,000 a year. About half of the men were employed in occupations with median earnings in the $8,000-$12,000 group, but only about a sixth of the women. The proportion of women in the better paying jobs is less yet. One finds a similar story with some modifications in the 1970 data for nonwhites. Over half of the nonwhites were in the under $8,000 group as compared with less than two-fifths of them whites. About three-eighths of the whites were employed in the $8,000-$12,000 group, only slightly more than the comparable proportion for nonwhites. Roughly, a fifth of the whites were employed in the $12,000 or more group as compared with less than a tenth for nonwhites. These differentials pose a significant challenge for our society which will influence vocational education planning. On one side, our society is committed to equal employment opportunity, and government agencies and unions are committed to affirmative action. On the other hand, if we look at what is happening in terms of job openings, we do notice some progress. But we also know that if the trends of the past continue that progress will be limited in most areas, and a large gap will arise between expectations and reality.

What can be the role of vocational education in reducing this gap by increasing opportunities for women or nonwhites and outmoding the projections of modest progress? One contribution which the educational system can make is in terms of counseling and guidance and making occupational information available. Another would involve changes in the distribution of enrollments in the vocational courses. If you looked at the data on vocational education enrollment by sex or race, you would find that it is not very different from the data on the distribution of employment. In the health-related vocational programs, for example, close to nine-tenths of the enrollments nationally are made up of women. Very few men are in the vocational education program related to health. In the trade and industry and the technical curriculum you would find something like the reverse with an overwhelming majority of males in these courses and a small minority of women. So the stereotypes of men's jobs and women's jobs which are becoming outmoded in our society are still perpetuated to a considerable extent in the vocational education enrollments.

Looking towards the future, there is one other problem which bears repeating. And that is what is often referred to as the demographic revolution. The birth rate has fallen sharply as those who have been attempting to get jobs in elementary education have been finding out. The recent slow-down in enrollments in elementary education will be followed later in this decade and in the early 1980s by declining high schools and, probably, community colleges enrollments.

The tradition in education for at least the past generation, if not more, has been that bigger and better go hand in hand. More enrollments, more programs, more physical facilities have been identified with progress, especially as more is translated into bigger budgets. Yet, there will probably be fewer enrollments in high schools simply because of declining population growth in that age group. What are the options for growth in this situation? I would like to raise one of the areas where growth in vocational education both in quality could be impressive. This is the area of adult vocational education, of converting vocational education into a closer approximation to "lifetime learning." Some adult programs are mainly oriented toward leisure time activities. Others are not. In society where most people change their jobs five or six times during their life, and in which social mobility usually means economic mobility, greater concentration on the adults who lack skills or want to upgrade their skills will be a critical element if vocational education is to keep on growing in the next 10 years and beyond.

Conference Board Study of Changes in Occupational Characteristics

Table 1
Average Annual Job Openings in Occupations Included in Study, 1970 to 1985

Occupation	Projected Average Annual Job Openings
Buyers & Shippers, Farm Prods.	400
Farmers, Owners & Tenants	4,600
Farm Managers	2,100
Farm Foremen	400
Farm Laborers, Wage Workers	-13,200
Gardeners, Groundskprs., Excluding Farm	21,900
Bank Officials & Financial Mgrs.	30,300
Stock & Bond Sales Agents	7,000
Delivery & Route Workers	27,100
Sales Mgrs. & Dept. Heads, Retail	18,900
Buyers, Whole. & Retail Trade	11,800
Rest., Cafeteria, & Bar Mgrs.	22,300
Salesclerks, Retail Trade	175,500
Salesworkers, Retail Trade	21,400
Salespeople, Service & Const.	14,000
Mgrs. & Adminis., NEC	247,500
Sales Representatives, Mfg.	16,800
Sales Representatives, Wholesale	31,200
Ins. Agts., Brkrs. & Undwrtrs.	23,800
Ins. Adjs., Exams. & Investigators	6,800
Mgrs. & Supers., Bldg.	13,000
Real Estate Agents & Brokers	26,900
Real Estate Appraiser	2,000
Recreation Workers	6,100
Registered Nurses	70,300
Practical Nurses	69,300
Nursing Aides, Orderlies & Attendants	97,200
Therapists	12,600
Health Aides, Excluding Nursing	22,000
Childcare Wkrs., Excluding Private Household	43,500
School Monitors	3,000
Dressmkrs. & Seamstrs., Excluding., Factory	7,500
Sewers & Stitchers	64,700

Occupation	Projected Average Annual Job Openings
Rest., Cafeteria, & Bar Mgrs.	22,300
Housekprs., Excluding Private Household	12,700
Bookkeepers	117,000
Bookkeeping & Billing, M.Os.	6,700
Calculating M.Os.	2,400
Tabulating M.Os.	200
Payroll & Timekeeping Clks.	14,300
Computer & Periph. Equip. Opers.	14,400
Computer Programmers	12,300
Keypunch Operators	13,900
Billing Clerks	16,500
Office M.Os. NEC	6,000
Misc. Clerical Wkrs.	50,200
Payroll & Timekeeping Clerks	14,300
Statistical Clerks	22,200
Shipping & Receiving Clerks	15,100
Graders & Sorters, Mfg.	2,400
Stock Clerks & Storekeepers	27,300
Personnel & Labor Relations Wkrs.	29,100
Secretaries, Legal) Secretaries, Medical) Secretaries, NEC)	384,800
Stenographers	3,700
Typists	111,600
Electrc. & Electron. Eng. Techs.	17,200
Other Techs., Excluding Health	5,300
Data Processing Machine Repairers	4,200
Radio & TV Repairers	4,400
Mechanical Eng. Techs.	600
Eng. & Scientific Techs., NEC	29,800
Tool Programmers, Numer. Control	100
Air Cond., Heat & Refrig. Mechs.	12,200
Auto Body Repairers	3,900
Painters, Mfg. Articles	5,000

Table 1 Continued

Occupation	Projected Average Annual Job Openings
Auto Mechanics	29,000
Farm Implement Mechs. & Repairers	1,400
Heavy Equip. Mechs., Incl. Diesel	31,100
Aircraft Mechs. & Repairers	6,700
Designers	7,700
Decorators & Window Dressers	5,900
Carpenters	40,100
Carpenter Helpers	-1,600
Carpenter Apprentices	500
Electricians	23,100
Bulldozer Operators	5,400
Excav., Grading., & Road Mach. Opers	15,300
Crane, Derrick, & Hoist Operators	5,100
Brickmasons & Stonemasons	7,400
Tile Setters	900
Painters, Constructions & Maint.	14,200
Paperhangers	900
Painter Apprentices	100
Plumbers & Pipefitters	18,300
Drafters	17,000
Telephone Line & Splicing Wkrs.	500
Electrical Power Line & Cable Wkrs.	2,400
Telephone Installers & Repairers	7,400
Radio & TV Repairers	5,000
Forepersons	51,800
Print. Trade Apps. ex. Print Press	-100
Print. Press Operators	4,900
Print. Press Apprentices	100
Photoengravers & Lithographers	2,000
Job & Die Setters, Metal	5,100
Machinists	15,200
Machinist Apprentices	300
Pattern & Model Makers, ex. Paper	700
Other Precision M.Os.	4,000
Cutting Opers. NEC	11,400
Drill Press Opers.	3,000
Grinding M.Os.	6,400
Lathe & Milling M.Ws.	5,400
Other Precision M.Os.	4,000
Punch & Stamping Press Opers.	7,900
Sawyers	4,800
Job & Die Setters, Metal	5,100
Structural Metal Crafts Wkrs.	3,600
Punch & Stamping Press Opers.	7,900
Sheetmetal Wkrs. & Tinsmiths	3,100
Sheetmetal Apprentices	300
Welders & Flame Cutters	26,000
Solderers	300
Hairdressers & Cosmetologists	49,100
Firefighters	11,700
Crossing Guards & Bridge Tenders	3,800
Marshals & Constables	500
Police & Detectives	19,000
Sheriffs & Bailiffs	2,900
Cooks, ex. Private Household	52,300
Food Serv. Wkrs. NEC. ex. Private Household	31,300
Misc. Mechs. & Repairers	8,800
Upholsterers	3,200
Cabinetmakers	2,800
Assemblers	44,500
Checkers, Examrs. & Inspe., Mfg.	33,300
Truck Drivers	38,000
Bus Drivers	13,800
Bartenders	10,200
All Occupations	4,944.000

Table 2

Comparison of Projected Vocational Enrollments with Projected Average Annual Job Opportunities in Occupations Included in Study

Program Area	Distribution of Projected Vocational Enrollments in 1977	Distribution of Average Annual Job Opportunities 1970 to 1985
Agriculture	8.9%	0.6% (2)
Distributive Education	9.1	25.2
Health Occupations	5.6	9.5
Home Economics (Gainful)	5.2	5.4
Office Occupations	28.2	29.2
Technical Occupations	4.5	2.0
Trades and Industry	38.0	23.3
Other (1)	--	4.8
TOTAL	100.0	100.0

(1) Refers to job openings in occupations not currently trained for in vocational programs.

(2) This percentage increases to 1.5 per cent if agribusiness occupations are included.

Table 3

Distribution of Employment in Occupations Studied Grouped by Median Earnings, 1970, 1985 (in 1973 Dollars)

Occupations with Median Earnings of:	Distribution of Employment	
	1970	1985
	100.0%	100.0%
Less than $6,000	12.3	1.0
$6,000 to 7,999	29.1	5.8
$8,000 to 9,999	23.8	16.8
$10,000 to 11,999	14.7	17.0
$12,000 to 13,999	7.8	10.1
$14,000 to 15,999	2.1	11.0
$16,000 to 17,999	10.0	14.2
$18,000 to 19,999	0.0	7.1
$20,000 and over	0.3	17.1
Total Employment (in thousands)	43,399	57,235

Note: Median earnings for all U.S. occupations was $9,945 in 1970 and is projected to rise to approximately $15,000 by 1985.

Table 4

DISTRIBUTION OF EMPLOYMENT BY SEX IN OCCUPATIONS STUDIED
GROUPED BY MEDIAN EARNINGS, 1970, 1985

Occupations with Median Earnings in 1973 Dollars of:	Per Cent Distribution of Employment			
	1970		1985	
	Male	Female	Male	Female
Less than $6,000	5.3%	24.7%	.2%	2.3%
$6,000 to 7,999	16.8	51.0	1.0	12.8
$8,000 to 9,999	29.6	13.6	7.1	31.0
$10,000 to 11,999	21.1	3.2	5.7	35.5
$12,000 to 13,999	10.2	3.3	13.0	5.9
$14,000 to 15,999	2.9	.9	17.2	2.0
$16,000 to 17,999	13.8	3.2	20.8	4.4
$18,000 to 19,999	-0-	-0-	10.3	2.3
$20,000 and over	.3	.1	24.7	5.8
Total	100.0%	100.0%	100.0%	100.0%
Total Employment (in thousands)	27,815	15,585	34,045	23,191

Note: Median earnings for all U.S. occupations was $9,945 in 1970 and is projected to rise to approximately $15,000 by 1985.

Table 5

DISTRIBUTION OF EMPLOYMENT BY RACE IN OCCUPATIONS STUDIED
GROUPED BY MEDIAN EARNINGS, 1970, 1985

Occupations with Median Earnings in 1973 Dollars of:	Per Cent Distribution of Employment			
	1970		1985	
	White	NonWhite	White	NonWhite
Less than $6,000	10.8%	28.9%	1.0%	1.8%
$6,000 to 7,999	29.5	24.2	4.9	13.3
$8,000 to 9,999	23.4	28.3	16.4	20.2
$10,000 to 11,999	15.1	9.5	16.9	17.2
$12,000 to 13,999	8.1	3.9	9.8	12.7
$14,000 to 15,999	2.3	.6	11.1	10.1
$16,000 to 17,999	10.6	3.4	14.4	12.3
$18,000 to 19,999	-0-	-0-	7.3	5.1
$20,000 and over	.3	.1	18.2	7.3
Total	100.0%	100.0%	100.0%	100.0%
Total Employment (in thousands)	39,888	3,511	51,356	5,879

Note: Median Earnings for all U.S. occupations was $9,945 in 1970 and is projected to rise to approximately $15,000 by 1985.

Table 6

Occupations Meeting Job Opportunity, Educational Attainment, and Earnings Criteria Used in Study

Occupation	Projected Average Annual Job Openings, 1970 to 1985
Sales Mgrs. & Dept. Heads, Retail	18,900
Buyers, Retail & Whole, Trade	11,800
Rest., Cafe., & Bar Mgrs.	22,300
Salesworkers, Retail Trade	21,400
Mgrs., & Admin., NEC	47,500
Sales Reps., Mfg.	16,800
Sales Reps., Whole.	31,200
Mgrs. & Supers., Bldg.	13,000
Real Est. Agts. & Brokers	26,900
Bus Drivers	13,800
Registered Nurses	70,300
Payroll and Timekeeping Clerks	10,100
Computer and Periph. Equip. Op.	14,400
Misc. Clerical	50,200
Statistical Clks.	22,200
Shipping & Rec. Clks.	15,100
Stock Clks. & Storekeepers	27,200
Delivery & Route Wkrs.	27,100
Pers. & Labor Rel. Wkrs.	29,100
Elect. & Electr. Techs.	13,300
Eng. & Sci. Techs.	29,800
Air Cond., Heat., & Ref. Mech.	12,200
Auto Mechs.	29,000
Heavy Eq. Mech., inc. Diesel	31,100
Carpenters	40,100
Electricians	23,100
Plumbers & Pipefitters	18,300
Drafters	51,800
Forepersons	11,400
Machinists	15,200
Cutting Oper., NEC	11,400
Welders & Flame Cutters	26,000
Firefighters	11,700
Police & Detectives	35,300
Checkers, Exam., & Insp., Mfg.	35,300
TOTAL	1,074,000
Total as per cent of Employment opportunities in all occupations included in study	39%

HIGHER EDUCATION AND VOCATIONALISM

Stephen P. Dresch*

A year ago I presented a series of lectures entitled "The Emerging Crisis of the Scholarly Enterprise" to an Emory University conference on the Role of the Undergraduate College in the Development of Human Future.[1] When the conference papers were finally published nine months later (actually a relatively short gestation period as academic publication goes), "emerging" had been dropped from the title, indicating the degree to which gloom has become pervasive in academe.

Clearly the current sense of crisis has not emerged de novo; the "new depression" in higher education has been a recurrent topic of conversation since the late 1960s. However, this perception of crisis has undergone a fundamental qualitative change over the last three years, and especially over the last year. As best reflected in Earl Cheit's Carnegie Commission volume, the original new depression was conceived as primarily a "financial crisis," not as a reflection of serious instability in the fundamental relationships between higher education and the rest of society.[2] The stresses exerted upon institutions were perceived as specific, impinging on particular components of the system, and while the sheer number of these particularistic strains insured that virtually all institutions were affected to some degree, only for a few did the wounds appear to be potentially fatal. The rest would muddle through and emerge more-or-less intact.

This harried but ultimately complacent attitude received its first serious jolt in the late spring of 1974, when statistics were released indicating a substantial drop in the college entrance rates of white, male high school graduates, the prime beef of the collegiate packing plants. What in its origins had been viewed as only a temporary shock resulting from the end of the draft could no longer be explained away so easily.

Since at least 1965, when Allan Cartter[3] first pointed out the demographic facts of life, higher educators had known that the rapid growth of the late 1950s and 1960s could not persist into the 1980s, but no one believed that a 10 or 12 per cent decline in the size of the college-age cohort (18-24) would lead to a decline in levels of college enrollment; rates of college attendance, which had increased from 9.1 per cent in 1940 to 20.5 per cent in 1960 and further to 30.6 per cent in 1970, were confidently expected to stave off the day of demographic reckoning. That confidence was destroyed by the experiences of '72 to '74.

These experiences, themselves disquieting, had a second, even more chilling consequence. Scholarly attention to the increasing educational attainments of the population had originated with the emergence in the 1950s of interest in economic growth and the discovery of the "unexplained residual," that component of growth which could not be explained by the raw increase in the economists' factors of production--labor and capital. The search for the unexplained residual was on, and although fragments have remained elusive, a significant fraction

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became identified, directly or indirectly, with education. Edward Denison, in his grail-like quest for the sources of economic growth, became the champion of the princes of higher education.[4]

In natural progression this identification of education as a significant source of economic growth led to the development of human capital theory, which attempted to augment orthodox income distribution theory to include this newly discovered factor of production.[5] In contrast to the somewhat round-about identification of education with aggregate growth, the human capitalists went to the heart of the matter, the relationship of education to individual incomes, and in the process gave educators a second grail as sacred in its own way as Denison's. Suddenly, public service advertisements could proclaim (somewhat misleadingly) that if you did not go to college you would sacrifice $200,000 in lifetime income.

The weakness of both the economic growth and human capital analyses was that they could not explain why education appeared as it did in relation to individual and national income. Growth theory identified the contribution of education via an accounting identity while human capital theory focused on ex post rates of return. The reason for this is not hard to find: As clearly demonstrated by Griliches, although the educational attainments of the labor force have shifted upward greatly, education-related income differentials had been remarkably constant over the entire period for which even roughly accurate data were available, generally 1940 to 1960.[6] The obvious implication for any even third-rate economist was that the elasticity of substitution was infinite, which in lay terms simply means that the relative representation of the highly educated can increase indefinitely without suppressing relative wages. No other interpretation would have occurred to a contemporary economist, nurtured on a static theory in which even secular development was characterized by a constant rate of growth, which simply served to give the classical stationary state an upward tilt, and for whom, apart from some vaguely perceived index number problems, an aggregate was no different than its disaggregated components.

To reach this conclusion some rather interesting data had to be thrown away. Treating the U.S. economy as though it simply produced undifferentiated widgets, human capital theorists and their elasticity-estimating associates ignored the fact that some very specific changes had taken place in the American economy, and that these had occurred in an equally specific demographic environment. As I have indicated in the current issue of the Journal of Political Economy,[7] between 1929 and 1948, although the college-educated proportion of the labor force increased from 5.2 per cent to 6.7 per cent, on average the college educated constituted the same proportion of employment within industries in both years. And while the college educated increased even more dramatically to 12.9 per cent of the labor force in 1969, roughly 60 per cent of this change can be explained by industry shifts in employment. In short, the period since the 1920s, and especially since World War II, has been one of remarkable change in economic structure, and this change has been one which necessitated significant increases in educational attainments.

However, this was also a period in which the demographic environment was least conducive to major changes in adult educational attainments. The rate of increase of the college age population slowed dramatically in the 1930s and actually became negative between 1940 and 1960.

In juxtaposition these two phenomena, rapid economic change and a contracting college-age cohort, served to create a persistent excess demand for highly educated labor, characterized by, first, high and sustained pecuniary rewards to college level educational attainments, and second, rapid increases in the rate of college attendance and completion.

Economists (and educators) who failed to consider these sources of change in college attendance necessarily failed to see the implications of the war and post-war increase in births, which over the very short period 1958 to 1964, served to double the population of eighteen-year-olds. Because the excess demand persisted (since these inflated cohorts would begin to enter the labor force only in the late 1960s and early 1970s), rates of college attendance continued to increase. When these swollen and highly-educated cohorts did finally hit the streets, it would not take long to convert a situation of excess demand into one of excess supply.

In the early Spring of 1974, when I first began to think in these terms, the latest data on income by educational attainment referred to 1968, a year which still more or less fits the 1940-60 pattern of virtual constancy in relative earnings in the face of significant increases in the representation of the college educated. Thus, it was impossible to empirically test the relationship between relative earnings and educational attainments. As a result, I concocted an educational attainment function in which the proportion of an age cohort completing college responded to changes in relative wages, combined this with an almost equally arbitrary function determining relative wages and came to the somewhat horrifying conclusion that, if the world behaved even roughly as the model assumed, rates of college attendance and completion would decline drastically after 1980.

The consequence can be anticipated. I was quickly denounced by a venerated academic statesman as betraying America's historical commitment to higher education and as frustrating the goal of equality of opportunity for women and for persons of all minority races and nationalities, all on the basis of concocted data.[8] And the previous failures of manpower planners, who had overemphasized the role of the sectoral and expecially occupational distribution of employment and had focused on periods that were much too short, were held aloft as evidence of the preposterousness of such anticipations.

This has been a rather round-about approach to the more devasting consequence of the discovery in early 1974 that rates of college attendance had in fact continued to decline. At the same time, income data for the period since 1968 was released, and together these sources permitted preliminary estimation of the relationships which had been forced to concoct. First, Stanley Nollen in his University of Chicago thesis and then Richard Freeman in a forthcoming article in the Journal of Human Resources found that (a) education-related earnings differentials had declined markedly since 1969 and (b) the subsequent decline in rates of college entrance could be better explained by this development than by Vietnam or any change in draft laws.[9] And Nollen bolstered his case by demonstrating that the same basic relationship explained interstate differences in college-going over the decade of the 1960s.

Thus, what virtually everyone had insisted on viewing as only a "financial crisis" has slowly begun to be perceived as a "real crisis". In response to my description of the financial plight of a nonprofit research organization with which we were both associated as "only a cash flow problem," my colleague Richard Ruggles responded that a cash-flow problem is simply the first stage of bankruptcy. Higher educators are now beginning to fear that this assessment may be correct.

As yet this fear has not led many commentators (much less higher educators) to seriously reconsider future prospects for higher education and to identify the adjustments within the system which will least disruptively respond to emerging developments. For example, the Carnegie Council's recent volume Beyond Survival and the Regents Report on Reducing the Scope of the University of Wisconsin System still attempt to walk a middle line between the euphoric optimism of the early 1960s and the engulfing pessimism of those who perceive the spectre of the 1980s.[10] The statesmen of higher education still wave the banners of the "explained residual" of economic growth and the simplistic assessments of human capital analysts, as demonstrated by the impassioned (if self-serving) pronouncements of Roger Heyns, president of the American Council on Education, Albert Shanker, president of the American Federation of Teachers, and James Harris, president of the National Education Association, before the 1974 White House Conference on Inflation.[11]

More threatening than these refusals on the part of higher educators to come to grips consciously with future possibilities are the signals from the environment which will serve to restore a sense of ultimate complacency. Specifically, we can now reasonably anticipate that incompetent national economic policies will sustain high unemployment rates for a protracted period. I need not repeat the familiar litany of the consequences. We all know too well which groups in our society bear the real burden of lost output and denied opportunities. But several of the perhaps more significant of the consequences are never mentioned. First, as a result of the effective unavailability of employment, educational enrollments, secondary and postsecondary, will rise dramatically, with several adverse results. One, myopic higher educators will view this reversal of recent trends as a vindication of their albeit shaken faith in their own futures. Two, during the period of high unemployment those who are led to persist in school will, on entering the labor market, concentrate even more of the burden of unemployment on those groups who would have borne a disproportionate share in any event. And three, assuming that after 1977 we do begin to recover from current economic mismanagement, the educationally inflated recession cohorts will cause the inevitable collapse of the highly educated labor market to be even more serious than it would otherwise have been, further exacerbating the resultant decline in enrollments.

The second potentially serious consequence of sustained high unemployment is the radical drop in fertility which appears to be occurring. We entered the recession with fertility rates below ZPG levels. Because of the nature of unemployment and especially the fact that the expected duration of unemployment is shorter for women than men, female labor force participation rates have continued to increase, with inevitable implications for fertility. While this will have obvious consequences for education after 1980, its ultimately most significant consequence can only be perceived by reference to the already severe distortion in demographic structure resulting from the post-war baby boom. The 1945-60 cohorts constitute a slowly moving clot in the age distribution of the population which (a) will not be significantly eliminated from the labor force by death and retirement until after the turn of the century, and in the interim, because of its inflated educational attainments, will significantly block avenues of upward career mobility to following cohorts, and (b) after 2010 will, in the absence of significant changes in the labor force participation of the aged, come to impose an increasingly heavy burden on the relatively smaller, economically-active population. For example even without a major recession-induced decline in fertility in the current decade, the ratio of persons between the ages of 18 and 64 to those 65 and over can be projected to decline from 6:1 in 2010 to 3.8:1 in 2030.

In short, persistently high unemployment will provide higher educators with a short-lived and ultimately Phyrric victory,

While not irrelevant to the subject of "higher education and vocationalism," the foregoing serves primarily by way of introduction, to demonstrate the absence of serious attempts to understand the forces which are operating to alter the environment within which social institutions exist and hence to alter the very nature of these institutions themselves. Ignoring that environment, our policy discussions exhibit so much fadism: Topic succeeds topic, institutional versus student support, support versus nonsupport, moral education, lifelong learning, ad infinitum, each addressed in a virtual vacuum with all participants sharing the fundamental but always implicit premise that there exists some "right" answer. In the academic realm the reductio ad absurdum of this approach is the suggestion of a colleague of mine (whom I hope, but without much faith, was facetious) that social scientists concerned with education should design the "ideal educational system." A wonderful thought, the ideal system, but ideal for what? Under what circumstances and for whom? Even to raise such questions is sufficient to indicate the absurdity of such a preposterous approach.

The point, simply, is that one cannot divorce education from its larger social environment, an environment which is not the same today as it was 200, or even 10 years ago. What was "ideal" for a society dominated by a merchant-industrial elite is unlikely to be ideal for a scientifically rationalized technocracy. What was ideal for an era (only recently ended) of excess demand for highly educated labor may not be ideal under emerging conditions of a persistent saturation of the highly educated labor market.

From this perspective the question of "vocationalism" in higher education, as it is usually framed, misses the point. The fundamental issue is not the normative one of whether higher education should in some abstract sense be vocational, but involves rather such positive questions as: What are functions (vocational and other) of higher education? How have these functions changed in the past? Are there forces which will serve, directly or indirectly to alter these functions in the future? Only by explicitly confronting these questions will it be possible to meaningfully address the normative issues of what higher education should be about and of how it should relate to other social institutions and even hope to emerge with action-orienting conclusions of relevance to policy.

The issue of the functions of education can be approached from two different, but interrelated, vantage points. One might be characterized as the "micro" approach, focusing on the role of education as perceived by individuals in the process of choosing between alternative present and future courses of action. The second I will characterize as the macro-social, concerned with societal expectations of, and demands and influences on, the educational system. From both perspectives I will argue, first, that higher education has in the past been overwhelmingly vocational, and second, that with an important qualification this will continue to be true.

The essence of the micro approach can be indicated by the following brief conceptual schema of what can be characterized as the career formation process broadly construed. For obvious reasons this schema will be cast in terms of the career formation process of young people and on careers which are pursued within the labor market. At the outset, however, I should indicate that I do not view this stage in the individual's career history or this range of careers as unique. The relative importance of particular opportunities and constraints will be very different for the young than the old, but the general framework is, in my view, "age neutral." Similarly, the choice between participating and not participating in the labor market is made on the same basis as the choice within either class of options.

The schema itself is really quite simple.

At each stage in his/her "life history," e.g., in the 10th grade, at high school graduation, or at age 30 (or 60), an individual can be described in such terms as his/her socioeconomic charactersitics, academic attainments and aptitudes, and past experiences (e.g., family and work history). Similarly, the objective, historically specific social and economic conditions facing this individual can be identified. These would include, e.g., employment and earnings prospects in alternative occupations requiring various levels and types of education and training.

At a point in time (and space) these objective environmental conditions are by definition identical for everyone. However, their implications for particular individuals may differ markedly. First, actual opportunities, e.g., the probability of admittance to and success and advancement in a particular career, may depend critically on particular individual attributes, e.g., academic aptitude, age, sex or race. It is important to note here that these relative opportunities may not be constant over time; thus, in a period of extreme excess demand in a particular occupation, certain individual characteristics may be much less important than in a period of excess supply.

Moreover, in the case of any activity requiring specialized training or knowledge the opportunities facing a particular individual will depend upon the characteristics of the educational system, broadly construed, which intervenes between the individual and the "ultimate" activity (further education, work, etc.). Thus, while the labor market determines the opportunities available to persons with different educational and other characteristics, the educational system determines the cost of and the personal qualities and characteristics required for admission to and success in alternative educational programs with their associated labor market outcomes.

Finally, individual, subjective perceptions of labor market, educational and other opportunities may not correspond to actual realities. Socioeconomic characteristics and prior experiences may significantly influence these perceptions. And particularly if educational and career opportunities are changing rapidly, the individual may guage, e.g., employment opportunities or prospects for educational success on the basis of past experiences which, due to lags in the adjustment of perceptions of realities, no longer provide good predictors of current or future opportunities. Again, the degree of inertia in the adjustment of individual perceptions to changing objective conditions may depend on socioeconomic and other characteristics.

Given the individual's perceptions of alternative career opportunities, of their educational prerequisites, and of the risks and uncertainties associated with these, he can be viewed as evaluating alternative educational-cum-career options. Actual, concrete options, of course, vary in a number of dimensions. For example, a particular educational program offered by a particular institution (or a particular career pursued in a particular environment) can be conceived as a bundle of specific attributes. Thus, the individual's choice of a particular career path can be viewed as the result of comparatively evaluating alternative attribute bundles.

A critical implication of the foregoing is that career decision-making must be viewed as a cumulative, continuing process, one in which past choices constrain but do not determine current decisions and in which decisions can, within limits, be modified in response to external, e.g., educational and labor market, conditions.

The secular, historical nature of the process in fact introduces major complexities. Thus, the individual must be viewed not only as comparatively evaluating currently available options, but also as anticipating future opportunities, recognizing that current decisions will make possible certain future choices but preclude others.

From this perspective the process of educational decision-making must be conceived of as a fundamental aspect and integral component of the more general and evolving process of adult career-formation. This is not to suggest that education must be considered only narrowly vocational. One of its distinctive (although hardly unique) characteristics is that for at least some individuals education may have value apart from specific career outcomes, and more importantly, education serves as an important source of information on career opportunities and on the student's probable relative performance in further education and in alternative later careers.

In summary, several critical dimensions of the educational-cum-career decision process must be captured by any meaningful analysis: 1) the objective current and future opportunities facing different individuals, e.g., the labor market options, including criteria for selection and advancement, available to persons with different types and levels of education and differences in other characteristics, and the nature of educational options, including criteria for and conditions of admission and success, 2) the relationship between actual conditions in these dimensions and individual perceptions and 3) the valuational weights attached to (the tradeoffs between) various attributes of available options by (for) individuals with different socioeconomic characteristics, academic attainments and aptitudes, and personal histories.

Despite its simplicity, previous research into the educational and labor force participation behavior of young people falls far short of meaningfully representing the important aspects of the process.[12] The reason for this, I would suggest, is the failure to consider the historically evolving macro-social dimension which ultimately serves to determine the objective environment within which the individual career formation process takes place.

The most important development in this dimension over the last one or two centuries is the merging of science and technology which has accompanied the maturation of science itself. The consequence has been a process of technocratic rationalization which has extended far beyond productive processes narrowly conceived.[13]

Jürgen Habernas, in Toward a Rational Society, identifies several important functions of education, among which are the transmission of functional qualifications, i.e., technical knowledge, and of extra-functional qualifications, i.e., the social qualifications required for the exercise of authority.[14] The emergence of the technocratically-rationalized society has shifted the emphasis in education, and especially higher education, from the latter to the former. The model of the university shifts from the elitist college devoted to classical studies to the land-grant institution devoted to the interchange between science and technology.

The reason for this transition is not hard to find. The fundamental consequence of technocratic rationalization is, with reference to the individual, an inevitable dispersion of power and authority. Actions are increasingly based on scientifically-grounded technological knowledge which can thus be independently verified, and actions themselves become fragmented as a result of increased technical complexity. The consequence is that one need no longer have faith in

one's doctor, but rather that one insist on his/her technical competence. With prescientific medicine faith in the physician's judgment (however acquired) and also in his/her morality were the most that one could hope for; with scientific medicine it becomes possible to objectively evaluate his/her judgment, while his/her morality becomes a matter of indifference. The current malpractice crisis is only the most obvious manifestation of the resultant change in the nature of medical practice.

As a result, that facet of traditional higher education concerned with certifying an authoritative elite has been increasingly transformed into a consumption activity. Its vocational basis has contracted, and as a form of consumption there is little justification for maintaining it as a precondition for the acquisition of technical knowledge or as the preserve of the young.

This process of change, of course, is not instantaneous, and it does not occur without disruption and dislocation. As much of the traditional curriculum loses its previous justification the first consequence is a general disintegration of criteria of legitimacy. To question the rationale for requiring a certain number of courses in, e.g., the humanities or social sciences is simultaneously to legitimate the introduction of courses in e.g., astrology or "popular culture."

The contemporary adjustment of higher education is made even more difficult by the saturation of the highly educated labor market discussed earlier. A remarkable characteristic of the higher education system over the last century of rapid growth is its flexibility, its capacity to respond to changing economic, social and student demands. However, it can be reasonably argued that growth has been the sine qua non of this flexibility. Malleability has been possible primarily because the sector has undergone rapid expansion; decline in particular areas has in general been relative, not absolute. This will cease to be true over the next two decades and the consequences are only superficially suggested by the Carnegie Commission's projection of change in the faculty age distribution which, even on the basis of extremely optimistic enrollment projections anticipates a decline in the proportion of faculties under age 35 from 28 per cent in 1970 to four per cent in 1990, while the proportion over age 50 will rise from 23 per cent in 1980 to 53 per cent in 2000.[15]

In short, the intermediate future will represent a deeply traumatic period for higher education. Enrollments will decline as a result of deterioration both in immediate post-schooling opportunities and in traditional patterns of career mobility. The decline in enrollment will render even more divisive the process of reorientation within higher education which would have resulted in any event from the change in the substance of social and labor market demands. Serious questions of legitimacy will be raised both within institutions and within the broader public-political arena, and external strains will be reinforced by the frustrations of the highly educated cohorts of the 1970s who will find their original expectations seriously unfulfilled, both in the short and long term.

While these developments will be pervasive in their consequences, it is difficult at this juncture to predict either the ultimate "equilibrium" or the nature of the transition process. For both we require much deeper understanding of the individual career development process and of the evolving social and economic environment than we now possess. However, I will hazard the guess that the next two decades will be traumatic not only for higher education but for the breadth of the educational system. In conjunction with such other developments as earlier physical maturation[16] and changes in the structure and functions of the family and hence in the socialization process by which children make the transition from dependence to independence,[17] the changes in the labor market

which I have described will serve to significantly reduce the importance attached to formal schooling, with an increasing fraction of education and training taking place in direct relation to work. The Coleman Panel on Youth perhaps anticipates the inevitable in recommending a reduction in the mandatory schooling age.[18] Notwithstanding its recent coinage, even the term "postsecondary education" may have little meaning in the emerging future.

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The presentation highlights certain issues and viewpoints regarding education and work.

Significance was attached to the fact that individuals be they holders of a baccalaureate degree or a high school diploma expect to obtain jobs, and that those jobs will be at least somewhat related to their training. Further, that these jobs will provide financial rewards and provide opportunities for promotion, and that the work will be creative in nature. Parallel to this thought was the indication that many individuals are dissatisfied with their jobs, and given present educational and economic trends , this problem may be more severe in the future.

A concluding thought focused on the need to take a broad view of what are the valid training objectives in regard to human resources. Additionally, emphasis was given to the belief that we keep an open educational system. One where we need to work out ways in which all ages, sexes, colors, and backgrounds can come back to the educational system as full- or part-time student and for short periods and long.

RELATIONSHIP BETWEEN THE WORLD OF EDUCATION AND THE WORLD OF WORK: ISSUES AND VIEWPOINTS

John C. Pittenger*

Because of my vast ignorance about the subject with which we are dealing, I am going to try to stand back a little bit from the immediate world of employment statistics and make some comments about certain problems that I see in the relationship between the world of education and the world of work. I don't suggest that these comments have any immediate application to what you were doing, and I leave it to you to decide for yourselves whether they would have any application at all. It seems to me that they do, but the applications are not always clear. However, these are some current concerns that we have in the department about the relationship between these two terribly important worlds.

It's been said fairly often in the last few weeks that the problem of the next decade or so is more likely to be a problem of underemployment than it is a problem of unemployment. And I think that's true and said so myself, in fact, as long as three years ago. I think it was three years ago at a talk I gave at the graduation exercises at Edinboro State College.

I think we have a pretty good economy. I think that the unemployment rate is, in fact, likely to go down in the next couple of years, although probably not as far as we would like. And what we have built into our economic system, some things like unemployment compensation and welfare benefits at a decent level, are likely to cushion the consequences of unemployment in ways that they certainly weren't cushioned back in the 1930s. The problem, therefore, is going to be for an awful lot of people, not that they don't have a job, but that they don't have a job that in their judgment comes anywhere close to using their skills and understanding.

The statistics on this point are quite clear. We are in Pennsylvania now granting high school diplomas to about 85 per cent of the cohort that enters first grade. About half of them are going on to some form of postsecondary education and about half of those that do are getting the baccalaureate degree. The fact is that very shortly somewhere between 20 and 25 per cent of all of the people, say between the ages of 25 and 30 or 25 and 35, will have the baccalaureate degree. Whatever one can say about the degree to which it does or does not equip one with useable skills, it clearly equips people with certain expectations about the kinds of jobs that they are going to have. Let me run through a little catalog of what I think those expectations are. This is based not on scientific research but on intuition. But I think it is not far from the mark. I think that the holders of those baccalaureate degrees expect that they will be able to get jobs. That those jobs will be ones from which they have been in some sense trained. That they will be rewarded at least modestly for them. That there will be chances of promotion. That the work will be creative and not routine in nature. That they will be working with people whose company they enjoy and that they will have some degree of control over the conditions in which they work. I suggest that that's not an unreasonable catalog of the expectations of young people receiving a baccalaureate degree in our society. One could make a similar catalog of the expectations of people with high school diplomas and the scale of expectations would be lower, but the expectations are there.

Now the fact is, I think nearly everybody agrees about this, that there is no chance, absolutely no chance that our economy in the next decade can provide

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employment to meet those expectations. There are several possible solutions to that. One is to say to hell with postsecondary education. It's simply training people to do work when there isn't any work and we ought to abandon that particular form of nonsense. I think at least in that form it would be a mistake. Though I must say I have some sympathy with the anger of young people today who take the position that we have mislead them about the consequences of the choices that they made. Another possibility is to try to change those expectations. Gradually stop saying, for example, that the possession of a baccalaureate degree will, say, result in a lifetime income of $236,419.84 more than the average high school diploma holder. I think we have begun to quit saying that. We damn well ought to quit saying it all together. So we can perhaps begin slowly to change some of those expectations.

It may also be possible to change to some extent the nature of employment itself. I don't know very much about this but there are people in industry who have been thinking along these lines. Specifically, seeing what can be done if, given an industrial situation, one changes the nature of work itself so that it is to some degree more satisfying than it has apparently been under conditions of mass production. I don't know that any of those are perfect solutions, in fact, I am fairly sure that they aren't. But there are at least three possibilities that are ahead of us.

Now, another problem not unrelated to the first one has to do with the terrible inflation in the kinds of credentials that are required of people who wish to be employed in our society. You all know that the kinds of work for which 50 years ago no education at all seemed to be necessary first began to require a sixth grade education, then a high school diploma, now a college degree, and God knows what's ahead of us on that score. I don't think it's hard to understand why that has happened. It's a combination of pressures on the one hand from the academic world and lazy practices of personnel officials in both public and private employment who wish to cut down the number of applicants by posing some fairly arbitrary criteria plus, in many cases, the genuine requirements of the job itself. The danger, I think, is that in the sort of society we are moving into where people are looking for jobs that don't exist, the temptation would be to go on increasing credentialing requirements for those jobs. If as a personnel manager in industry you used to be able to cut down the number of applicants for a salesperson's job by saying that only people with a baccalaureate degree need apply and now you find that you have got 500 of them applying for five jobs, why not try requiring a masters degree. It will certainly cut down the number a little more, and it may push some people into getting a masters degree who wouldn't otherwise do so. The problem of course is that to work for the masters is quite likely to be irrelevant to the kinds of work you are asking them to do. Therefore, you would be making a useless investment of resources. That is, I think, a very real possibility. I don't know what the solution to this problem is going to be. The courts may impose some upon us. We have already the Duke-Power Case. The Supreme Court decided, you may recall, three or four years ago in a case like this coming from North Carolina. Here a utility company could not impose tests for promotion, and I think it was the format that was not related to the work, at least where they had the effect of discriminating against blacks as was demonstrably the case there. So far the courts, I think, have not extended that prohibition beyond the civil rights field, but I don't think it takes much imagination to see the possibility that in the next decade it will have a wider application.

Another possibility lies in the area of a legislative enactment. I have, myself, proposed a bill now in the General Assembly. Thanks to Senator Hill of Philadelphia, it's a frank bill. It has only one sentence, which one can't say

for many bills. Since it has only one sentence I have memorized it and that one sentence says simply, "that no employer, public or private, shall require as a condition of employment or promotion any degree, diploma, certificate or other educational credential not reasonably related to the work to be performed." It hasn't exactly been going through the General Assembly with gusto, but I am convinced that is only because the Genreal Assembly hasn't understood the really revolutionary implications of the bill. When we get the school code passed, the adult education, the career opportunity bill and a few other things, I will bring my attention to that much neglected piece of legislation.

A third possibility, in which I confess I don't have great hope, is that common sense may prevail, and that without any help from the courts or the legislative bodies we may ourselves, we meaning employers, public and private, stop proliferating these requirements and start taking the position that we really don't want to ask for credentials that aren't reasonably related to the work. We have made a very modest beginning in that direction in my department. A couple of years ago we started going through all of the civil service requirements that said that to hold a particular position you had to have five years of classroom teaching, five years as a principal, five years as a superintendent, three years as a I.U. director with a Ph.D. and started saying, "now does that really make sense in this particular case," and of course there are cases where in fact it did. There were also cases where it didn't. In those cases we tried to scale down a little bit some of those requirements. I don't much expect other people to do that, but I have hopes.

Now a third problem that relates, I guess, more to the first than the second has to do with this question of what it is the educational system is supposed to be doing any way. And here, at the risk of getting in trouble, but I am always in so much trouble that it doesn't seem to make any difference if I am in a little more, I want mildly to criticize the U.S. Commissioner of Education who has suggested in some recent speeches that the whole point of a college education is to teach salable skills. Now that, it seems to me, is subject to a couple of weaknesses. One, that it is an awfully narrow view of what we are doing on this globe anyway. We are, of course, here. Even if one doesn't take a truly logical view of it, you don't say, "We are here, but to stay here most of us need to be employed." I don't want to suggest that that is unimportant. I simply want to suggest that that isn't the only thing that we all do. Most people, in addition to having a job, are also husbands and wives and parents and children, they are citizens and taxpayers, they are consumers, they are people with their feet on the green grass and their heads in the blue sky and they have perfectly legitimate concerns that come dangerously close to suggesting, that all those things are subordinate to one role as a wage earner I think is a great pity. It is also, I think, dangerous even if we focus simply on the question of jobs and making a living. There is, I think, a great danger in defining too narrowly what our schools and colleges are trying to do. Let me give you a couple of examples that have come across my desk recently. One of our major universities, with which I have some responsibility, passed an ordinance to its board of trustees not too long ago defining a new major--that of the translation of the scientific text from the Russian language. Now, I am not quarreling with the notion that if the Russians write something in astrophysics that's worth reading about in English, there ought to be somebody around who can translate it. Further, I am not quarreling with the idea that it would be nice if the translator knew not only the difference between various kinds of infinitives in Russian, but also if he knew a little bit about astrophysics. What does worry me is the fact that this university may be turning out the people who, if something happens to the Russians or to the astrophysics, may suddenly not have any employment skill. Another thing came to my desk this morning. One of our state colleges wants to

award a bachelor of science degree for something called office administration. And I had, for a fleeting moment, a vision of courses in filing, courses in what kind of telephone extension to order, you know whether pink, or black or white and the virtues of intercom systems and other earth-shaking questions. I suspect there is more to it than that and in the usual blind faith that my bureaucracy has, I did the sensible thing and signed a piece of paper allowing them to create this program. I confess that I did have misgivings.

The point is there is great danger that in this rush to avoid unemployment we will define salable skills so narrowly that in the long run we will have contributed to the problem rather than solve it. How do you solve it? Well, I am not sure. One avenue is clearly to suggest that there are other aims of education than winning bread, however valuable that may be. Another as I suggested is that we ought to take a broad view of what it is we are training people for, training people to hold down a cluster of related jobs and not a single nitch that may easily become obsolete. And a third is that we have got to keep a pretty open educational system. We can't anymore allow ourselves the luxury of thinking that people who are 18, 21 or 25 have finished and we need to work out ways in which all ages and sexes and colors and backgrounds can come back to the educational system full-time or part-time for short periods and long. Further, that they get the financial help they may need to do that in order to either train themselves for other kinds of employment or simply to increase the possibility that they don't find life on this globe terribly painful.

I don't know how helpful those comments are. I suspect they are terribly unhelpful, but they were in a sense intended to be that. I don't want you to be complacent and to think that you are planning for a kind of world which is likely to look like very much the one we are in now. I don't for a fact know very much about what it will look like. Sometimes I am not sure I want to know what it will look like, though I have some official responsibilities in that matter. I am simply suggesting to you that there are hidden within some changes now taking place some quite drastic innovations, I think, in the nature of our social system.

I tried out on a couple of groups of people recently a little set of slogans which I don't suggest are more provocative. But suppose we were as a nation to decide that for the next quarter century our motto would be slow is beautiful, simple is beautiful. What would the consequences of that be? Because see, we live in a society that has been hooked for years on the notion of power, the notion of speed, the notion of complexity. I frankly think that we are so deeply hooked that we can't change, but there are people who disagree with me and I of course hope I am wrong. But what would be the consequences for the kind of work you're doing if, in fact, any substantial number of Americans can take seriously the notion that our society is far too complex, far too hooked on authority, far too anxious to make changes for the sake of making change. I don't know. And I don't suppose any of you do either. It may be that these are the evening meanderings of one who has been in public office too long. If you tell me that, I will not be the least offended by it. I simply suggest that there are some things happening that need to be taken account of. How? Perhaps simply by hedging your bets and perhaps by making clear as you give us your best efforts, your projections and prognostications about the requirements of the job market and the needs and demands upon the schools and colleges, that you put a little asterisk at the bottom and say, "P.S.: That's if the world doesn't change radically." And then if it does change radically, as it surely will, it will not impeach or otherwise put you in jail.

III

The orientation focused on points for the individuals to consider when participating in the symposium deliberations. These points centered around definitional as well as objective functions of the process involving the generation of labor market information and the development of educational and training programs. More specifically emphasis is given to the need for providing information and/or programs to better equip the student and future employee with the abilities to adapt to a changing labor market.

ORIENTATION, DIRECTION AND PEP TALK

*Seymour L. Wolfbein**

If you haven't seen the New York Times this morning, you ought to because there is a fascinating article that you might want to read. It's called "Hudson High Carries On," by Russell Baker. Let me read you a few excerpts. It starts off with "Remember Hudson High? Jack Armstrong's old school? It turned out go-getters in Jack's day, and it's still turning them out today. Not for the graduates of Hudson High to surrender to idleness and do-nothing resignation to unemployment which we see in the graduates of so many other schools this summer."

"Hudson High men don't quit, and that goes for Hudson High women, too, like Lila Hermianax, who pooh-poohs the prophets of doom and gloom trying to tell her that women can't make it in America anymore.

"'Pooh-pooh', Lila said to this interviewer, recognized as Russell Baker, when asked if the depressed job market made her give up her ambition to become a professional wrestler. Then, laughing gaily, she lifted the school principal, pinned him with a body slam.

"'There's still plenty of opportunity for people with imagination, thighs like boulders, arms that can crush a python', Lila said. 'Is the market gutted with lady wrestlers?' 'Of course,' Lila said, 'that's why I'm going to be a gentleman wrestler. Let me show you.'"

This goes on and on to discuss the impact of occupational information on the job market and career choices today. If I could, I would spend what little time I have reading the rest of this article because it's relevant (as we say in academia) to what you are going to be up to today, and it picks up from the vantage points of Secretary Pittenger's conversation with you last night and what's appearing in the news these days about the job market.

May I make with all humility the following suggestions to you who will be going through the program this morning and returning for the summarization: As you make your way through today, ask yourself whether you are discussing labor market information, the techniques of collecting that information, or curriculum, or all the other plans and programs and techniques and devices that are reviewed--ask yourselves can they really run the gauntlet of the following three items:

The first one I suggest to you is as follows: Does the education or training or guidance or preparation of labor market information and all the other suggested programs take into account the fact that they are part of a process which should enable the individual to withstand, or to put it more positively, to take advantage of, the inevitable changes which occur in the relationship between what that individual learns and what the individual is going to be called upon to do.

Let me give you a personal example. I don't want to give my age away, but I graduated with a baccalaureate degree more than a third of a century ago. I was one of those who majored in economic theory, which took some doing. As the president of the college handed me my diploma, a book appeared entitled The General Theory of Employment, Interest and Money, by J. M. Keynes, and it obsolesced me lock stock and barrel as I was getting the diploma. And I think the test of the

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education I got turned out to be whether I really was able to cope with that very important change in my field. Did it give me the vantage point from which I could be flexible enough to adapt to change? I challenge you to name any occupation which is immune to this point. Let me give you another example. In my family, our mother used to beat on us to be a doctor, that is, an M.D. I was the only black sheep of the family. All I got was a Ph.D. but I am surrounded by M.D.s. I remember Uncle Al, who became a specialist in the performance of mastoidectomies. In my generation if you got an infection of the mastoid bone in the ear, there wasn't much you could do but have a surgical procedure on it. My memory is still vivid on Uncle Al as he went around apparently 24 hours a day doing mastoidectomies. The years went by and along came 1945 and the discovery of penicillin and all of a sudden you didn't need a mastoidectomy. There was Uncle Al, famous surgeon from Park Avenue, New York City, obsolesced if I may say so, lock, stock and scalpel. He had to make a change and he did make a change that is relatively immune to all of this, because he is now practicing obstetrics and gynecology. However, when I look at the birth rate these days, I am not so sure about that either.

Long before you people were practicing in this field, the National Vocational Guidance Association put out a magazine called Occupations, since changed to the Personnel and Guidance Journal. It used to carry on its masthead the following maxim which was supposed to describe the field of vocational guidance: "Vocational guidance is the process which enables a young person to choose, enter upon and succeed in the occupation of his choice." You can just hear the violins playing in the background. The only thing absent from this definition was "and to retire gracefully from it at the appropriate time." But you and I know that is not the way it really works out. How many of us really went to school, learned a field, entered into it directly and are now practicing in it? If you did, please accept my heartiest congratulations! Can we really stipulate what the educational prerequisites for employment are? Do we really know? Perhaps our goal should therefore be to provide the best basis for a person to be as flexible, maneuverable and adaptable as possible to change. How responsive are our programs to that challenge?

May I suggest that you may want to take the following into account: In his discussions with us last night, Secretary Pittenger raised some excellent questions about the validity of educational credentials. It reminded me of the time I was in Washington, when I was Director of Manpower Training and when I suggested that the Congress pass a law in which all Americans receive a Ph.D. upon birth, and then go on to get the education they need. At that time I didn't realize that a Ph.D. in academia is called a "terminal degree," which may be more descriptive than many think. Now, Congress is not going to pass that law, and we're going to continue to credential people all over the place. Among the various difficulties this engenders is that it misses a very important point, i.e., that we cannot homogenize people, that individuals do indeed differ. Think about that as you go through your day. Isn't the really important point to present people with a menu from which individuals can maximize their choices consonant with their skills, talents and interests? Isn't this what would maximize people's ability to respond to the inevitability of change? Again, whether you're putting out Occupational Outlook Handbook or whatever you are doing, the point to remember is that we are trying to prepare people whose one common denominator is their individual differences. Even in evaluating job prospects and outlooks, can we really issue materials that characterize whole fields as "poor" when we know that some people will indeed be winners in just those fields? And I say again without pointing to anyone else. I am pointing at myself, because as you know I have been just as culpable in forgetting this as anyone else.

My final and third point I will make by giving an example and you'll get the point. When the first Occupational Outlook Handbook came out it was considered very successful. I don't know how many occupations we had in it, but our projections turned out very well as a later study documented. We did, however, have a statement on the outlook for engineers, which followed us for the last quarter of a century and haunted us since then. I think we made a very bad mistake in that case by basing our outlook statement, not on the long range prospects, but the immediate, near term outlook. We forgot our own maxim: Keep your eye on the long-range ball. Information for career counseling is different from job placement information. Career information should focus on the long-term situation, not on the vagaries of a given year's labor market situation. Both are important, but both are different from each other.

And so as I leave you, see whether, when we get together this afternoon, if you can't respond to how well we can do our jobs in the context of what we talked about (1) in terms of change, (2) individually oriented, and (3) in terms of making a contribution to an individual in making those choices for long-range employment.

Coming back to Mr. Baker, he says: "Is there a message here for kids in other graduating classes? You bet your bubble gum there is. Hudson High has shown that if you've got enough imagination, initiative and good old American determination to make a buck without depending on Uncle Sam to hand it to you, America can still be the kind of opportunity, depression or no depression. Raise the flag for Hudson High boys, and girls too."

Of course he is doing this with tongue in cheek, but if you read him through, I think you will see that he says, perhaps more engagingly, what we have tried to get across to you this morning in our more prosaic language.

IV

LABOR MARKET DATA AND METHODOLOGY

The session on "Labor Market Data and Methodology" provided a broad overview of significant Bureau of Labor Statistics' programs. Specifically, a description of the "Occupational Employment Statistics" programs and occupational projection methodology were highlighted.

The complexities of dealing with labor market data and the generation of such data were emphasized. Also, an overview was presented of the areas which need further study, such as occupational supply and mobility.

Evidence was given which indicated that significant progress has been made in the area occupational projection methodology. However, it was emphasized that more needs to be done to improve the methodology and the reliability and validity of the resulting data.

OCCUPATIONAL EMPLOYMENT STATISTICS PROGRAM

Myron H. Levine*

For more than a decade educational planners, manpower analysts, economists, and others have vehemently expressed a need for current regional and local data on employment by occupation, for projections of future manpower requirements by occupation, and information on the current and prospective supply of workers by occupation. While some progress has been made, it has not been considered adequate to meet the needs of the majority of users.

Since the early 1960s, manpower and educational legislation has continually underscored that manpower training and vocational education be conducted in areas of proven occupational need. Evaluations of manpower training conducted over the years have repeatedly cited the lack of local labor market information on occupational demand as a source of considerable concern by manpower and vocational education planners.

The Bureau of Labor Statistics received in November 1972 the official Department of Labor responsibility for providing consultation and technical assistance to State Employment Security Agencies concerning State and area occupational projections. Several programs were developed to meet the needs mentioned above.

The Security Agency is representative of what all cooperating states are or will be doing (including Pennsylvania).

The following description of a Comprehensive Manpower Information System** can be considered as representative of what all cooperating states are or will be doing as a part of the Bureau of Labor Statistics Occupational Employment Statistics (OES) program.

For many years now, national economic policy has been directed toward maximizing job opportunities while minimizing unemployment. The Area Redevelopment Act of 1961 was a step toward this goal; so was the Manpower Development and Training Act of 1962, the Vocational Education Act of 1963, which was amended in 1968, and more recently the Comprehensive Employment and Training Act of 1973. All important steps forward, and all emphasizing the relation of education and training programs to needs. And this focused sharply on the need for *INFORMATION* about current and anticipated changes in occupations and skill requirements. We've been in the manpower information business for a very long time. But the precision of our *manpower forecasts* was increased sharply in 1969 when a study called "Tomorrow's Manpower Needs" was published by the U.S. Bureau of Labor Statistics. From our point of view the two most significant contributions in the report were the National Industry-Occupational Matrix and the methodology for making manpower estimates and projections based on the national matrices.

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**The following was taken from the publication by John Wrisley, "Comprehensive Manpower Information System, (sound and slide program)," Draft #4, South Carolina Employment Security Agency, January 1975. Selected revisions were made for the purposes of this publication by the editor.

The development of manpower forecasts can be a tricky business, because there are really two ways to measure employment. One is by occupation, the other by industry. The sums of the two approaches are the same. Both are embodied in the matrix concept. For example, if we count the number employed in each occupation in any industry, the sum would equal the total employment in that industry.

At the risk of oversimplification, the matrix, as we use it here, represents the typical or average staffing patterns of all the industries included in the matrix. In effect, the matrix represents the number and kinds of jobs which are normally found in a given industry. Through this concept, we are able to develop estimates of current and future employment by occupation, requiring only the additional input of industry employment data. This is a unique feature of the matrix, the key to our system.

The matrix is probably the most significant development to date in the field of manpower statistics. It was developed and kept current through continuing surveys and *INDUSTRY PROJECTIONS* which give us the data we need to complete a detailed analysis of manpower-needs information; information which can be valuable to governmental planners; educators and counselors; private industry, and many others whose job it is to keep in touch with the constantly changing manpower picture.

A typical output table from the national matrix shows current and projected employment. The industries included in the matrix are presented on the *horizontal* scale while the occupational data are shown *vertically*. We can run down the vertical line to any given job, such as medical and dental technicians. This is an important job in the health field. By moving across the table *horizontally*, we can illustrate the number of medical and dental technicians that are employed in each industry. By *summing* the employment from each industry, we can determine the total number of such jobs that we have in the nation. (For example, in 1970 some 106,350 medical and dental technicians were employed in the United States in hospitals alone. Present indications point to a rapid growth in this field of work, and by 1980, some 205,050 will be needed in hospitals to satisfy the manpower requirements for medical and dental technicians). On the whole, by pointing out the probable needs for this job in hospitals and similar needs in other industries, we have a data base from which a number of important decisions can be made, not the least of them being decisions relating to manpower training to satisfy the needs of industries.

Ideally, a Comprehensive Manpower Information System must be capable of gathering, storing, integrating, retrieving, analyzing, and disseminating information on manpower demand and supply, by industry and by occupation, within a short time at a relatively low cost. Moreover, of primary importance, the system must be flexible and capable of meeting specific informational needs of not only the state but economic subdivisions of the state. Our system was developed on a total employment concept. All classes of workers in a given labor force are accounted for--including nonfarm wage and salary workers, farm workers, household workers and the self-employed. The latter groups represent a declining proportion of all jobs in most states; however, some states, agricultural employment, at least, still has special training implications.

Until recently, the only information on staffing patterns available to apply to the Tomorrow's Manpower Needs methodology was *census* data. This lack of current data on industry staffing patterns led to a new statistical program which was launched in 1970; a cooperative federal-state effort funded by the

U.S. Department of Labor, Manpower Administration with the Bureau of Labor Statistics responsible for technical assistance. The program is called "The Occupational Employment Statistics Program," or OES for short.

There are three distinct components in the OES program....

1. SURVEY OPERATIONS
2. INDUSTRY-OCCUPATIONAL MATRIX
3. PROJECTIONS

First, the Survey Operations:

An ongoing mail survey was begun in 1970 to collect data on the staffing patterns of industries. These patterns tend to change slowly over a period of time, so surveys are conducted each year and are cycled over a three-year period--which means that approximately one-third of the economy is surveyed each year. This gives us three distinct advantages:

1. Employers are asked to provide occupational data only once every three years. This minimizes the workload and the cost of data collection.

2. No part of the data base which is used for making occupational projections is over 36 months old.

3. Significant changes in the staffing patterns of industries can be identified early, as the trend develops.

Provisions have been made in the data mechanism to accommodate changes in our economy, such as the addition or closing of a large firm or changes brought about by technology. Indeed, we remain constantly sensitive to any change that could affect the accuracy of our information and make whatever adjustments are number, or -- for noncovered establishments, a special *survey number*, plus county identification. The INDUSTRY CLASSIFICATION is made according to the Standard Industrial Classification Manual, which gives our Comprehensive Manpower Information System a framework based on a thoroughly reliable *national standard*. Through our occupational survey, we gather information on the number and kinds of jobs in each establishment. The survey questionnaire contains a list of jobs and their descriptions commonly found in the industries being surveyed--and the employer indicates the number of workers he has in each occupation listed. A section is provided for reporting additional jobs that were not prelisted. A job code is assigned each occupation, making it possible to relate each occupation to other occupational coding systems, such as the *Dictionary of Occupational Titles*, the Census, or the Office of Education Code. This means that various *data users* can relate the occupational statistics developed in our Occupational Employment Statistics program to their specific needs, such as training programs or job counseling.

While the survey is conducted largely by mail, it is back-stopped with telephone calls and personal visits, especially in cases where a large establishment's response is crucial to the precision of our information. Also, telephone contact is made to clarify any question concerning information gathered in an individual establishment's report.

A *second* major element in the Occupational Employment Statistics Program is our INDUSTRY-OCCUPATIONAL MATRIX. We described the matrix earlier as a representation of the typical staffing pattern of an industry. That is, it

indicates the number and kinds of jobs which are normally found in a particular industry. Actually, a matrix shows the *ratio* of employment in each occupation in an industry to the total employment in that industry. There are some basic premises involved. 1. Generally, the occupational composition of individual industries is distinctive. The garment industry, for instance, is comprised chiefly of sewing machine operators, while the construction industry consists mainly of craft workers, such as bricklayers and carpenters. 2. Differences in the occupational composition between establishments in the same industry and size class tend to be minimal. Two construction firms of the same size, for example, will likely have about the same distribution of bricklayers, carpenters, painters, and so on. Implicit in this assumption is that staffing patterns vary depending upon the size of the employing unit, and our system provides for these differences. 3. The proportional distribution of the occupations comprising a given industry tend to change slowly over time. To illustrate, in the construction industry, the relative proportion of carpenters to total employment in the industry would not change significantly in the short run. Total employment is expected to expand over the study period, but the proportion of carpenters to all jobs in construction likely will remain the same. 4. The *employment level* for a given industry is the primary determinent of the *occupational level* within the industry. There are other factors which determine the occupational pattern within a given industry, and which are responsible for the differences between the occupational pattern of one industry and another. The system takes into account many of these factors, such as: goods produced, services performed and size of establishment. Unfortunately, there are some variables which our system cannot provide for such as: Volume of production, age of equipment, worker skills, wage rates and labor supply.

The *first step* of actually building the INDUSTRY OCCUPATIONAL MATRIX, once data are collected, is to collate establishment data by industry, size group and occupation. Let's assume a hypothetical industry. For purposes of illustration we have intentionally reduced the number of firms and number and kinds of jobs in this industry. Remember, however, an industry includes many firms. This industry contains firms in each of our four basic size groups; the first being firms with 1 to 19 workers. Group two contains firms with 20 to 49 workers...group 3 is comprised of firms with 50 to 99, and size group 4 contains firms with 100 or more workers. Now, let's take a closer look at example No. 1 which shows the distribution of sample employment for our hypothetical industry by size group and occupation. Once the occupational data are aggregated to this point, that is, we have collected industry employment and occupational data on the firms in our sample, the statistics are then *inflated* to the *universe employment* by industry and size group. Universe employment refers to the total number of jobs as opposed to the *sample* employment which is only a part of the universe. Our huge computer system handles the actual mathematics involved, in addition to processing mountains of other information involved in the project. But the procedure used is this; we apply the *ratio* of *universe to sample employment* in each industry by size group to the sample employment reported for each occupation in each industry by size group. This ratio is called an "inflation factor". In size group one in our hypothetical industry the inflation factor is 1.5. We reach that factor using the following procedure. Knowing that the total industry universe employment in Size Group 1 is 1500 we divide that number by 1000 (the sample employment). This gives us the 1.5 inflation factor with which we reach a "universe" employment for that size group. We apply the same formula to size group 2...size group 3 and 4.

After the occupational data are inflated to the universe employment for each size group in each industry, we then *sum the employment* for each unique job in each industry without regard to size group. This gives us estimates

of current employment for each occupation in each industry. The final step in developing the matrix is to calculate a *ratio for the employment in each occupation* in each industry to the *total employment in the industry*. It is these ratios that make up an industry-occupational matrix.

This table gives us a summation of employment in each occupation in our hypothetical industry *and* the industry-occupational matrix ratios for this industry, giving us a detailed description of the staffing patterns of all industries in the matrix.

The third element in the Occupational Employment Statistics Program is *projections*. By applying current industry employment estimates and projections to the appropriate industry-occupational matrices, we can arrive at current estimates and forecasts of employment by occupation. To make occupational projections in our information system we rely on an industry time series going back a number of years. This is simply historical data on employment by industry. Detailed information on employment by industry is vital to the development of reliable occupational projections. After the industry time series are compiled, a series of economic and noneconomic assumptions are made concerning the *study period*...the time interval covered by the projections.

Economic trends are, of course, strongly influenced by developments as the international and national levels, along with developments at the local levels. The energy shortage of early 1974 are a classic example of our economy's being affected by international events. It's for this reason we make several assumptions before projections are made. Factors involved include:

1. The level of economic activity, particularly with respect to whether this activity will stimulate full employment over the study period.

2. Government spending is a key factor, whether it is federal, state or local. We consider the level of spending and the types of spending.

3. Consumer and business expenditures are important considerations in the projection process as are trade agreements which affect industry production and employment.

4. So are technological innovations and their effect on the demand for labor.

5. General trends in demand for goods and services are closely monitored. These trends are reflected in our projections.

6. International trade is another vital factor...particularly as it affects the nation's balance of payments to other countries.

7. Population trends, of course, must be included and we are constantly studying the changes in the labor force composition. Average...participation of women and youth in the labor force...birth rates...net migration and many other population factors.

8. Such elements as environmental concern, certain materials shortages, national defense and several other factors also have a strong influence and are considerations in our projections. Once the assumptions are made, we review them with appropriate representatives of business associations, representatives of private industry and other government agencies for consistancy and reasonableness. We then go to work making employment projections for each industry in the economy.

Projection technique is extremely important. We employ the use of regression analysis to project future employment levels by industry. The following illustrates the procedures. Individual industries are studied carefully. For industries in which it is determined that past trends in employment are not indictive of future trends, a variety of variables are tested against historical data. The resultant projections are then carefully analyzed and frequently refined by manpower analysts who are familiar with the state's economy, industry trends, previous forecasts, new and pending legislation and population developments which could have a bearing on the project.

Finally, the projections are then reviewed by individuals in private industry, business associations and other government agencies before they are accepted as final and incorporated into our system.

For example, let's consider a hypothetical industry. The base period shows an estimated employment of 15,000. Our projections indicate an increase of 500 over the study period. Each of the employment figures is now ready to be applied to the industry-occupational matrix. Taking the matrix ratio we apply it to base period employment and the projected employment to derive occupational estimates and projections. The difference between the current estimates and projections of occupational employment represent the number of workers required as a result of expansion in employment in a given occupation between the base period and the target period. But there's one more factor, and it, too, is important. Because workers needed for expansion, or those needed to satisfy the expected growth in an occupation, is only part of the story. Current estimates and projections of replacement needs by occupation must be made to derive the total net change in demand for each occupation over the study period. Replacement needs refer to the number needed to replace existing workers who die or withdraw from the labor force for such reasons as retirement and childbirth. Total manpower requirements for the future then are represented by the sum of workers needed for both expansion and replacement.

The method used for estimating replacement needs relies upon 1. working life tables which have been developed on an actuarial basis by sex, and from which age-specific separation rates by sex are developed, and 2. the 1970 census distribution of the state's labor force by occupation, age and sex. Distinction between age and sex is essential because age affects death and retirement, and sex is a key factor in withdrawal rates. The labor force withdrawal rates for women are typically higher than for men. So you can see that the development of this type of information is difficult.

Manpower information is most useful if put into the hands of data users for planning purposes as soon after the first of the year as possible -- especially if plans are being prepared for a fiscal year. Generally, the data produced from our system are tabulated near the end of each calendar year, and copies of machine listings, such as the example here, are available shortly thereafter. The industry and occupational employment estimates and projections are then summarized in a formal document. For example, in South Carolina the publication, MANPOWER REQUIREMENTS AND RESOURCES IN S.C. INDUSTRY AND OCCUPATION is made available for the data users. At present, information is published on approximately 200 industries and 800 occupations. In addition, analysis is provided on both industry and occupational trends, pointing out the changes occurring in industry composition and occupational fields.

How do you use a Comprehensive Manpower Information System? In a word, for planning. Planning is an old concept, but a relatively new practice; therefore, our system is geared to providing information with which to plan in any area

in which manpower information is a factor -- whether it be planning of education and training programs, allocation of resources, management decisions by industry or counseling students in choosing careers. New uses for these data are evolving every year, but there are some we consider especially important:

A. JUSTIFICATION OF TRAINING PROGRAMS

Industry-occupational estimates and projections help pinpoint current and future job needs which will often justify specific training programs to meet these needs.

B. STRUCTURING TRAINING PROGRAMS

ANALYSES OF MAJOR OCCUPATIONS to determine structuring training programs. By analyzing the occupational and skill demands over the study period, it is possible to establish detailed programs that make more efficient use of resources.

C. SKILLED WORKER DEMAND-TRAINING PROGRAM

These forecasts are valuable in evaluating present training programs and preparing programs to meet future needs. Our information system is a key resource to anyone in the program-planning profession.

D. PROGRAM FEASIBILITY STUDY

Demand data are important in evaluating the feasibility of training programs--including making decisions about phasing certain programs out when their usefulness is over. Current programs can be studied in the light of current data and projections, and the need for implementing new programs can be determined. This information can lead to enormous savings in dollar resources.

E. MANAGEMENT DECISIONS

By providing realistic information on current and future manpower requirements these data can help businessmen in their planning efforts and provide the basis for effective management decisions.

F. STUDENT COUNSELING

Forecasts of occupational demand are also valuable to job counselors who can help young people make more intelligent decisions about their future in the world of work.

We have talked about demand--which we can measure. At this moment we're working hard on this *Supply* component. Frankly, this element is difficult to measure, but we're working with the Bureau of Labor Statistics in a cooperative effort to solve this problem.

In fact, an intensive research project is already under way at the national level to develop a reliable methodology for estimating and projecting the supply of labor by occupation. At present we know how to measure and project the potential input to supply from institutional sources. It is that very substantial portion associated with the private sector of our economy that is so difficult to measure. Recent studies by the Bureau of Labor Statistics suggest that about

one half and sometimes more of the potential input to supply comes from the private sector or from noninstitutional sources. However, given our present data base, it is possible to plan for the future with far more precision than was possible just a few years ago.

This knowledge can be augumented further by examining information on job openings, which is available from Employment Service operations particularly those openings that are hard to fill over time. In addition, help wanted advertisements can be studied to detect trends in the need for workers. In the final analysis, if our information system points up an imbalance in the demand and supply of workers for a given occupation, and if we determine that this imbalance likely cannot be met from existing institutional sources and from the private sector unless some adjustments are made, then from the point of view of manpower planning, we have the basis for making decisions regarding the allocation of resources for education and training to satisfy the future requirements of industry. This in effect is the essence of planning. A COMPREHENSIVE MANPOWER INFORMATION SYSTEM is designed as a dependable planning tool. It is structured to help planners, educators, guidance counselors, and representatives of private industry intelligently make their way into the future with respect to changes in manpower requirements. Obviously, the more we know about the industrial mix of our economy and the occupational composition of our labor force, the better we shall be able to deal with the imbalance of supply and demand in specific occupations. The ultimate goal of our system is to make the most efficient utilization of our financial and human resources.

Our data helps maximize the employment level and reduces unemployment to the lowest level possible. It provides information which can have a meaningful impact on economic growth....and lead to a continuing improvement in the quality of workforce skills. Our population is approaching 3 million people--and our labor force one and a quarter million. We cannot afford to do less than maintain one of the most efficient manpower information systems in the nation; to provide the data necessary to reach decisions in our planning.

OCCUPATIONAL PROJECTIONS METHODOLOGY

Joseph S. Cangialosi*

In November 1972, the Bureau of Labor Statistics (BLS) received the official Department of Labor responsibility for providing consultation and technical assistance to state employment security agencies concerning state and area occupational projections. Unofficially, the bureau had, to a limited extent, been acting in an advisory capacity since the late 1960s, or since the release of the first four volumes of the Tomorrow's Manpower Needs (TMN) series. Prior to BLS involvement, however, there had been a program for the development of such data. This responsibility was centered in the department's Bureau of Employment Security for well over a decade.

The basic methodology proposed was referred to as the area skill survey. The procedure followed in this survey was for state employment agencies to conduct a personal visit or mail survey of local employers requesting data on current occupational employment and forecasted requirements. Forecast periods ranged from one to five years, and estimates of replacement needs were often requested as well. Economic assumptions, occupation lists and definitions of occupations varied from survey to survey, and the efforts were often one-time studies.

Concern began to grow during the mid-1960s regarding the value of this procedure. Critics raised not only practical questions such as high costs of the process, short life of the projections, and lack of uniform standards, but also questioned the conceptual underpinnings of the effort, i.e., the ability of employers to be reasonably successful forecasters of their own manpower needs.

The disenchantment culminated in 1968 when the Advisory Committee on Research to the U.S. Employment Services recommended in its report on labor market information that the area skill survey program be phased out. Furthermore, the committee suggested that active experimentation should be initiated to test the feasibility of the BLS occupation-industry matrix as a method of forecasting demand in large local labor markets on a statewide basis. With this urging, BLS began the experimental work that culminated in the Tomorrow's Manpower Needs reports.

National Occupational Employment Projections

The industry-occupational employment matrix has for over a decade been a principal tool in the preparation of national projections of occupational employment. The present national matrix shows employment in 421 detailed occupational categories cross-classified by 201 detailed industrial sectors and six class-of-worker categories. Both occupational categories and industrial sectors are exhaustive so that the matrix is a comprehensive count of all employment. Viewed in another way, the matrix illustrates the occupational profile, or percentage distribution, of employment in each industrial sector. These profiles or occupational patterns can and do vary substantially since each industry will seek to utilize a certain combination of labor skills in its activities. It has generally been hypothesized that the occupational structures of many industries remain relatively stable over time. Consequently, if reliable data are available on the occupational composition of individual industries for a base period, these data can be applied to projections of employment by industry to yield initial projections of occupational employment for the target year.

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However, in many industrial sectors occupational patterns do change significantly over five-to 10-year periods with the advance of technology, the changing supply of workers, the change of the wage structure, and a myriad of other factors. Information on the influence of these factors is used to modify the occupational patterns of the individual industries. Therefore, in actual practice, the adjusted or projected occupational patterns are used together with projections of employment by industry (developed exogenously from the matrix) to prepare projections of occupational employment.

In other words, the preparation of occupational projections through a "matrix approach" requires two basic inputs, namely, a set of industry-occupational staffing patterns for a target year and a corresponding set of industry employment projections. National industry projections, based on normative assumptions about the economy in the target years, are developed through the use of a 134-sector input-output model, regression analysis, and studies of individual industries.

Tomorrow's Manpower Needs

The Tomorrow's Manpower Needs series, originally published in 1969, described two basic methods of preparing occupational projections for states and areas that used the national matrix and other national and local data as basic inputs. To provide more up-to-date information and reports on research efforts, the bureau has released in the past few years a number of supplements to the series. Prior to 1974, over forty states had prepared projections, some including labor market areas within the state, using primarily the first of these methodologies, which we termed "Method A." In the past year or so, we have completed the Interim Area Manpower Projections Project, which produced, in cooperation with the individual state employment agencies, projections to 1980 covering over 400 occupations for 48 states, and over 100 SMSAs or special sub-state economic areas using a modified "Method A" approach.

"Method A," as described in TMN, consists of directly applying the industry staffing patterns of the national matrices to their corresponding detailed estimates of base year and projected industry employment for the area. Each set of results is then summed across industries to obtain occupational totals and a change factor from base year to projected period is computed for each occupation. Projections for each occupation are derived by applying these change factors to separately estimated base period occupational employment levels. Thus, area projections are developed within the context of national economic and technological trends, using two factors that we believed to be most important in estimating occupational growth--industry growth or decline, and shifting patterns of occupational employment within industries.

We were aware, however, even when first publishing TMN, that "Method A" had several built-in biases, among them the incorporation of national industry-occupational patterns, which may differ substantially from those prevailing in the local labor market. Furthermore, states would be forced to rely primarily on decennial census data for base-period occupational employment estimates; thus, incorporating problems of possible undercount, response bias, and classification error. When projected data are to be used in the vocational education planning process, there is the further difficulty in lack of correspondence between the census occupational classification and the vocational education curriculum classification categories developed by the Office of Education.

A second method, "Method B" as described in TMN, was designed to alleviate the first of these difficulties, the use of national staffing patterns. This method required development of special state (area) base-period industry-occupation matrix.

Each cell of the base-period state (area) matrix would then be projected by applying to it change factors based on trends from the national matrix (computed, generally, by dividing each projection national matrix cell by its matching base-period national matrix cell). Then the projected area industry staffing patterns would be multiplied by corresponding projections of area industry employment, and total occupational requirement obtained by summing across industries.

While we and many state agencies believed this method to be superior, particularly for generating employment estimates for labor market areas, most states and areas found the lack of detailed data then available (late 1960s) and the time and expense required to construct the matrices prohibitive. Additionally, some bias would be introduced by the use of national staffing pattern trends, and this method shared the other problems we have mentioned with "Method A."

Replacements

No discussion of occupational employment projections would be complete without a consideration of replacement needs. Many analysts have expended considerable time, effort, and money to develop complex and sophisticated models that generate projections of occupational growth or decline, forgetting that for most occupations and for many states and areas replacement needs will form the overwhelming proportion of future job openings. I would like to make clear that I am talking about separations from the labor force, not occupational or geographic mobility. For the nation as a whole, from 1972 to 1983, about two-thirds of all new entrants to the labor force will be needed to replace workers who die, retire, or leave the labor force for other reasons.

The relative importance of replacement needs is often even more significant by state, or by occupation. For Pennsylvania, a rather slow expansion of about nine or 10 per cent in total employment is projected to occur from 1970 to 1980. During this period about four times as many job openings will be generated by separations from the labor force as are due to expansion, 1.6 million as opposed to about 400,000. In the professional category, replacement openings are about twice the number of projected growth openings, while in the operatives category, over 250,000 openings will occur due to separations while virtually none occur due to growth.

In the Baltimore SMSA, total employment is projected to expand about one-fifth from 1970 to 1980. Here, replacement openings are expected to be one and a half times greater than growth openings. Even in Florida, one of the fastest growing states in terms of employment, replacement openings are expected to account for almost half of total job openings. Growth is expected to be about two-fifths in the period from 1970 to 1980, with total openings of nearly two million and over one million generated by replacement needs. Clearly, any projection system that ignores estimates of deaths and retirements will present an incomplete and biased picture of occupational manpower needs.

In Volume I, Appendix A of the original TMN series, the bureau presented national occupation-specific death and retirement rates by sex to aid state agencies in developing estimates of separations by occupation. These rates were computed by applying age-specific rates from national tables of working life to the national age distributions for each occupation in 1969. Thus, the number of losses by occupation, as a per cent of employment in the occupation, provided a national average rate.

Although we also described a method by which state-specific rates could be developed, most states, due to data, time, and resource limitations chose to use the national rates to estimate separations. Such a procedure assumes that the age dis-

tribution for an occupation in any state or area closely approximates that for the nation. Research undertaken subsequent to the release of TMN and published in Bulletin 1769 tested the validity of that assumption and also investigated some relatively simple procedures for revising the national rates to remove discrepancies when used for states and areas.

These tests showed discrepancies ranging up to 27 per cent with differences of 10 per cent or more common. Thus, we concluded that for some states and areas, the use of national rates introduced serious error, and further, that no simple adjustment, for example, based on median age, would correct the difficulties. During the development of the national-state matrix system, we undertook the task of developing occupation-specific rates for all states and the District of Columbia. This project has been completed; state-specific rates were used in the interim project, and state tables of rates were recently published as Supplement No. 4 to the TMN series.

I would like to emphasize again the importance of replacement estimates when we wish to have a complete picture of manpower needs and the accuracy required for a set of growth projections. As I mentioned previously, if accuracy in total openings is the desired criterion, then the permissible error in occupational change projections will vary according to the growth rate of the area and the prevailing death and retirement rates. For examples of extreme cases, assume that the acceptable error in <u>total openings</u> is 10 per cent. If the 10-year growth rate is one per cent and the annual death and retirement rate is 2.5 per cent, a projection of growth openings could be in error by as much as 260 per cent. At the other extreme, if the growth rate for 10 years is 90 per cent and the death and retirement rate is one per cent annually, we could afford only 11 per cent error in our growth projection, to remain within the 10 per cent level of accuracy in total openings.

In summary, although we have made significant progress towards improvement in the occupational projections methodology additional efforts need to be made by all concerned. From our vantage point the contributions made in the development of the National Industry-Occupational Matrix and the methodology for making occupational estimates and projections based on the matrices, although highly significant, certainly present challenges to continue these efforts and to improve them at both the federal, state and local levels.

Finally, an important concern of the Bureau of Labor Statistics is our need to have feedback from people at the state and local levels who have a need for and also who generate certain labor market data as to the adequacy of our efforts and results in meeting their planning and programming data needs.

FUTURE DIRECTIONS FOR OCCUPATIONAL SUPPLY ANALYSIS

Neal H. Rosenthal*

Over the past several years considerable effort has been devoted to the development of information on job opportunities in specific occupations for the nation as a whole and for states and areas. Most of these efforts have been devoted to developing data on demand and only limited data on supply have been developed. As a result the data on demand has not been used to its potential, because supply-demand analyses could not be incorporated into career guidance information and information designed for use in education planning. Over the next several months, however, the bureau is planning to significantly expand its studies of occupational supply.

Data on demand are generally presented in terms of the number of job openings that are expected during a specific period of time. The concept is rather simple, even though we all know that complex problems are involved in their development. Supply data are conceptually more complex and many persons mean different things when refering to occupational supply. For example, what should be identified as the supply of typists to compare with numerical estimates of job openings. Is it a combination of the number of workers completing typing training in institutional programs, combined with the number of persons with typing skills who are expected to reenter the labor force? Is it the proportion of those completing typing training to who can be expected to enter typing jobs plus the number of persons who can be expected to reenter the labor force and take jobs as typists? Or, should all persons with typing skills who are working in other occupations be considered as part of the supply together with all new graduates with typing skills, regardless of the vocational program that the student completed? The same questions can also be raised concerning other occupations, even those requiring more highly developed skills such as construction craftsmen, scientists, and engineers.

Perhaps any of these concepts are valid for specific purposes. For the analyses that we conduct at the bureau we use the following concept of supply: Those workers who can be expected to seek work in a specific occupation based on a continuation of past patterns of study and work. Thus, the supply of engineers is defined as new engineering graduates who can be expected to seek work as engineers, new graduates of other college curriculums who can be expected to seek work as engineers, workers in other occupations who can be expected to seek work as engineers, persons outside of the labor force, other than new college graduates who plan to enter and seek work as engineers, and immigrants with engineering training who can be expected to seek work as engineers, all based on trends in the patterns of work in these categories who obtained engineering jobs in the past.

Estimates of the supply of workers using this concept can be developed for a specific period. However, in a specific period of time supply is heavily affected by labor market conditions including such factors as relative salaries among occupations, the level of unemployment, the availability of jobs in specific localities, knowledge of the job market, and a host of other economic and noneconomic factors that affect the number of workers seeking and finding jobs in a specific occupation. Labor market conditions, however, are not static. Continuing shifts occur in relative salaries, job opportunities, and in the availability of training opportunities. Therefore, projections of supply should not be treated in the same manner as pro-

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jections of job openings. Supply generally adjusts to demand through market mechanisms. Information on supply should be considered, therefore, as information to use in helping the market adjust.

Supply information can be used in a variety of ways toward this end. In vocational guidance, it can be used to help individuals plan their career by avoiding surplus occupations and preparing for occupations with good prospects, education planners can use the data to expand program in areas where workers are likely to be in shortest supply, and program planners can use the information to avoid situations where manpower shortages hinder the attainment of program goals or which exacerbate current shortages.

Supply data can be quantified although this is not sufficient. Those setting manpower policies also require information on how supply responds to wage levels, union rules, pension plans, licensing regulations and other economic and noneconomic factors. Such data are not currently available, and in the short run it is unlikely that complete understanding of market mechanisms on supply and their translation into numerical estimates will become available. Nevertheless, valuable information can be developed that at least can guide decisions and narrow the potential for erroneous policies.

During FY 1976 the bureau's efforts will be devoted primarily to filling in data gaps rather than to studies aimed at understanding labor market behavior. Without the basic data, concepts of labor market behavior will have only limited practical applicability. The bureau has planned its supply studies for FY 1976 around the schematic model of the flow of workers into and out of an occupation. Entries, reflect supply and separations, reflect demand. The latter combined with growth sum to total job openings.

Let's look at what supply data are available. Training data are available or can readily be developed for institutional training provided in colleges and universities, public vocational education programs, government-sponsored training programs and registered apprenticeship programs. Only limited data are available on graduates of private vocational schools. Despite the availability of data on completions, only limited data are available on the proportion of individuals entering the occupation for which they were trained.

We do not have adequate data on the number of workers completing employer training programs other than registered apprenticeship programs. We do not have adequate data on transfers into an occupation from other occupations except for a very small number of occupations, and even these data are generally old. We do not have adequate data on the occupational choice of workers entering the labor force who are not entering directly from an institutional training program. We have limited data on immigrants on a national scale which have little effect on any occupation except physician, but we do not have adequate data on interstate mobility by occupation.

As you can readily see, the supply gaps are great. But even our demand data have shortcomings. Data on job openings resulting from transfers to other occupations are not available, except for a limited number of occupations, nor is data on emmigration. For state analysis, we do not have data on occupational losses due to interstate migration.

Despite the lack of so much data, some work has been done on supply and supply-demand analysis. At the national level, supply-demand analyses have been conducted for some occupations for which specific college level training is required. In general some data on occupational mobility and labor force reentrants are available for these occupations or analysis has indicated that entrants from these sources are very

small and the analyses are not significantly affected by a lack of such information. Among the occupations in this category are physician, dentist, engineer, physicist and chemist, life scientist, mathematician, veterinarian, optometrist, and pharmacist.

For many other occupations studied in the occupational outlook program, tabulations have been developed of all available institutional training statistics together with data on job openings that are expected to result from growth and labor force separations. The usefulness is limited because data on mobility, as affecting both demand and supply are not available. Yet, the data do give some indication about potential training needs.

Some states have developed similar supply data. For example, South Carolina has developed data on the number of graduates of institutional training in several occupational categories to compare with projections of openings for growth and labor force separations. The resulting information on job openings and training are shown side by side with the differences titled "shortage" or "surplus". This type of statistic is very valuable for planning vocational education training programs and for use in vocational guidance. But, I must admit the numbers scare me because of the imcompleteness of the data, especially on occupational mobility. For example, suppose annual openings of 1,000 are listed in occupation A and openings of 500 in occupation B and the data on institutional training may show that 1,000 persons are being trained in occupation A and 400 in occupation B. The conclusion would be to increase training in occupation B. But suppose mobility data were to show that 300 persons transferred from occupation A to occupation B each year because this was natural career ladder. Then the conclusion would be to increase training in occupation A and cutback occupation B. The weakness of supply-demand analyses without using mobility data are obvious. The example also does not include employer training data. This availability of such data can also change conclusions.

The data that are lacking for supply analyses can be classified into four groups: 1) occupational mobility; 2) geographic mobility; 3) follow-up studies of graduates of institutional training programs and 4) completions of employer training programs. The bureau has initiated the following studies in each of these areas.

Occupational mobility data from the 1970 Decennial Census data are currently being analyzed. In the census, workers were asked their occupation in 1965. This data can be constructed to develop occupational mobility rates for the 1965-70 period. We have developed this data from the 3 one per cent census public use sample tapes which show for each of about 400 occupations and annual rate of transfer to other occupations for the occupation as a whole and by age and sex, and the occupations to which individuals shifted from each occupation. Data also have been generated that show the 1965 occupational distribution by age and sex of workers who shifted into an occupation from 1965 to 1970.

In addition to the data on occupational mobility, tabulations have been developed that will enable labor force separation rates to be developed for each occupation. Under current procedures, these rates are based on the separation rates in specific age groups applied to the appropriate age-sex distribution of each occupation. With the census data on mobility, separate patterns for each occupation can be developed.

We have recently developed the basic tabulations of this data. The first analytical step will be to evaluate the data. One of the first procedures in the evaluation will be to look at the statistical reliability of the data; this is likely to result in many of the smaller occupations being dropped from further analysis. We also will be comparing the census data with other studies having

mobility data, including the longitudinal studies being conducted by Herbert Parnes at Ohio State University, a couple of CPS studies, postcensal studies conducted by NSF, and a few mobility studies conducted by professional societies. We will be looking for consistency of mobility patterns among these studies so we hopefully can gain some confidence in the census data. It must be remembered it is recall data, which is always suspect.

In addition to the development of occupational mobility and labor force separation rates, the data can generate other valuable information. Career ladders can be identified by looking at the patterns of occupational shifts. By looking at the age distribution of entrants we may be able to identify entry occupations as well as occupations that are filled primarily by experienced workers and by persons reentering the labor force.

It will take us about a year to complete our studies of the data.

Geographic mobility is of course one of the major factors to consider in analyzing supply for individual states. Some new insights into this subject may be able to be developed from the same body of data that are being analyzed to obtain national occupational mobility data. From the 3 one per cent public use sample tapes, data can be generated on the occupational distribution of workers shifting into each state and proportion of workers in each occupation in the state in 1965 who moved to other states between 1965 and 1970. Data can also be developed on occupational mobility rates for workers in each state who remained in the state, in a comparable manner to that described above for the nation as a whole. These data are now being tabulated for 14 states in the Southern region; these tabulations will be used to evaluate the reliability of the data. Checks will be made of the consistency of the data among states and with other data, and comparisons of the occupational mobility rates for the 14 state regions as a whole will be made with the U.S. totals. If the data appear reliable for sufficient occupations, we will eventually develop tabulations for all states. The results of these studies are not likely to be available until next year.

Follow-up studies of college graduates are very important for supply studies. The most comprehensive study to date was of 1960 college graduates in 1962. We have only had use of limited data from other sources. However, we recently located a body of data compiled by the American Council on Education on 1971 and 1972 college graudates. We have just signed a contract to purchase this data and hopefully results of our analysis will be available for use early next year. Of course, this data will also be evaluated before we use it and make it available for general use.

Completions of employer training programs are also being collected by the bureau, but on a limited basis. Two years ago the bureau completed a small pilot study which indicated that employers could provide data in a mail survey on the number of individuals enrolled in and completing training to qualify them for work in specific skilled occupations or to upgrade their skills in the occupation in which they were currently working. We are now conducting a more elaborate survey, although still of a pilot nature, to collect data in four metalworking industries (SIC's 34, 35, 36, and 37) for 14 skilled occupations. Data will be collected on completions and enrollments in training programs conducted on the job and off the production site in order to qualify workers for a specific occupation or to upgrade their skills in their current occupation. A variety of other information also will be obtained, including 1) why training is given, 2) characteristics of the training staff, 3) content of the training, 4) benefits to individuals completing training and 5) how employees are selected for training. The survey results will not be available until July 1976.

Following the development of some basic data on these four aspects of supply during FY 1976, tentative plans have been developed to issue a manual which will present procedures for states to use in analyzing supply. Of course, significant items will be relayed to potential users as soon as possible, but it is unlikely that any formal publication can be developed before the end of 1976. This, however, does not mean that states with resources and a desire to proceed must wait until the BLS work is completed to undertake studies of supply.

Certain data can be identified now that must be developed by states to fit in with any systematic approach that will be developed in the future. Such data include completions of institutional training programs, including colleges and universities, public vocational education, junior and community colleges, private vocational schools, government-sponsored manpower training programs, and registered apprenticeship programs. Some states have already done this and I would suggest contacting those states (including South Carolina and Oklahoma) to identify procedural problems, data sources, and costs.

Data on college and university graduates by state are now available from the Office of Education, although up-to-date information is not available. Individual schools have the data, however, and with some effort state data can be obtained that are current. Data on public vocational education programs are available from the state vocational education departments. Data on private vocational education programs are not compiled in a consistent basis on a national scale, but they can be developed by each state. National data on government-sponsored manpower training programs were available to some extent in the past before CETA. Now the data must be compiled from state sources. Registered apprenticeship completions are available by state from the National Office of the Bureau of Apprenticeship and Training. Data on public junior and community colleges should be available from state departments of education; old data on a national basis, although limited, are available from the National OE Office.

State data on the career patterns of individuals completing training programs can also be compiled. Data on college graduates may be available from some schools within a state. Data are available for those completing many government-sponsored training programs, although in some localities available data are incomplete. However, states can develop programs that provide comprehensive data; some states have systems to obtain follow-up data. I suggest states interested in developing programs contact those states (Oklahoma).

The development of a comprehensive program by a state to conduct supply analysis is likely to take several years. For those states where little progress has been made to date, it will be a significant undertaking and I would advise that the development of the system begin on a limited basis. Limited studies can result in considerable payoff in the short run. For example, using procedures developed by the BLS, data on demand (job openings for over 400 occupations) can be developed for states. Then, if supply data is developed for approximately 50 key occupations, a supply/demand analysis can be made which will provide valuable planning information. If supply data can be developed for only about 50 key occupations, the benefits could be great. Studies can be limited to those occupations which are significant in terms of identifying potential manpower problems. Consideration in selecting occupations for analysis should key on occupations that are large, where specialized training is required for entry, where significant numbers of workers are trained in institutional programs, where potential supply-demand imbalances may result because they are concentrated in growing or declining industries. Such occupations can be identified from reviewing the industry-occupation matrix data, both current and projected, and available data, even if it's somewhat old, and completions of institutional training programs.

My discussion has been primarily devoted to the development of data. But sight should not be lost of the primary purpose for obtaining the data; that is, for use in analysis. Therefore, analytical studies of important specific occupations or occupational clusters can be very worthwhile. Information on the existence of current shortages, whether employers are hiring persons who are not adequately trained, and planned expansion of government programs affecting specific occupations can be very valuable in planning. Comparison of supply-demand data can even be misleading without some understanding of labor market conditions.

Studies of this nature are not new to many states. For example, many health agencies have conducted studies of health manpower. Studies of teachers, technicians, and skilled workers have been conducted by New York State and I'm sure other states have concluded similar studies.

To summarize, a lot of information is being developed at the national level that will aid states in supply analysis. However, much of this data will take time to develop and transmit to states for their use. In the interim period very worthwhile efforts can be pursued by states, both concerning data development and analytical studies, to proceed along a course designed to provide comprehensive information on occupational supply.

IV

MANPOWER RESEARCH AND INFORMATION FOR VOCATIONAL EDUCATION (LESS THAN BACCALAUREATE DEGREE)

The second group session presents information focusing on the needs of individuals and agencies responsible for occupational education and training requiring less than the baccalaureate degree.

It was emphasized by the session participants that the individuals involved in program planning and decision-making at both the state and local levels need labor market information. Its purpose is to assist them in developing, continuing or curtailing various educational training programs to meet existing and future conditions.

The presentations showed that a wealth of occupational information is available but the knowledge of how to use it effectively is a major problem. Also, the interrelationships of information such as that produced from graduate follow-up studies, student interests, and occupational supply/demand were shown to be helpful if developed with a decision-making framework.

NATIONAL LONGITUDINAL STUDY OF THE HIGH SCHOOL CLASS OF 1972

Kenneth A. Tabler*

The National Longitudinal Study of the High School Class of 1972, or NLS as we refer to it, is a survey designed to find out what happens to high school seniors after they graduate from high school. This study is now about half way through a projected six-to-eight-year period of data collection. We are looking into the education, job training and vocational histories of a national probability sample of 23,000 students. It is designed to provide data on four principal areas. These include: the development and persistence of career patterns and aspirations, the characteristics and abilities of those who pursue various kinds of postsecondary education and occupations, the impact of federal funds and programs, and the extent to which educational experiences have prepared youth for work. The study is not designed to test research hypotheses as such, although the vast amount of data we are collecting will enable us to do some of that; instead, the primary purpose is to provide substantive data for educational and occupational decision-making at the federal level.

The history of the NLS goes back to 1968 when the National Center for Educational Statistics (NCES) conducted a user study. One of the findings indicated that educational policymakers and researchers needed student data that would allow comparison of educational experiences with later outcomes. As a result of this study, a users committee was formed, made up of the various bureaus within the Office of Education, to plan the NLS. These bureaus were all interested in postsecondary education, with those in higher education being particularly interested in access to postsecondary education, demand for postsecondary education and financial aid programs. They are frequently required to testify on proposed OE program revisions and new legislation. Consequently, a good data base from which to derive results was needed. At the same time there was another bureau planning to do a longitudinal vocational impact study relative to the effects of the educational amendments of 1968, which was merged into NLS. Thus, in terms of the broad spectrum of OE programs and policy information needs, it was decided to build a data base that was broad enough to answer many questions about education, training, and work.

A conference was held in 1970 and leading educational researchers and administrators met with federal officials in Washington, D.C. to advise NCES on plans for the survey. One of the things that was discussed, and you have to remember that the Coleman report was still uppermost in the minds of the people at that time, was the finding that schools didn't seem to make very much impact on students. So it was suggested that we also include items on aspirations, attitudes, goals, and plans as new avenues of investigation.

In 1971 a field test was conducted in ten different states, on a sample of 900 students so as to pretest the questionnaires and field procedures. Beginning in the spring of 1972, primarily in April and May, the base-year full-scale survey was launched.

The design parameters for the study were originally aiming for a sampling of 21,000 students and 1,200 different high schools. The stratification variables were

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control (public and private), geographic regions, school enrollment, proximity to institutions of higher education, percentage of minority students enrolled, income level of the community, and degree of urbanization. Putting all these stratification variables together, 600 strata were formed from which two primary and two back-up high schools were selected, each one with a known probability. Then a random sample of 18 students was selected within a school. Individual high school participation involved appointing an administrator and completing the following questionnaires: a group administered student questionnaire and a test of verbal and non-verbal ability, a school record information form for securing data from the student's school file, and both a school and counselor questionnaire, the latter to be filled out by a sample of two counselors.

The student questionnaire concentrated on activity plans after high school in terms of education, work, and family. As I mentioned early, we had a number of items in the questionnaire relative to attitudes, goals and aspirations. We also included questions about their knowledge and planned use of federal programs that provide funds for further study beyond high school.

Given the above sample design for conducting the survey, we didn't realize our goal of either the number of students or the number of schools. Of the 1,200 primary sample schools, 949 participated, 21 had no senior students enrolled, and 230 either refused to participate or could not due to receiving the request too late in the school year. However, a back-up sample of 95 schools did participate.

Due to the large primary sample school nonresponse in the base-year survey, NCES made further attempts in the summer of 1973 to secure their participation as well as to replace the 21 schools that had no seniors. This "resurvey" activity, initiated prior to the first follow-up survey involved securing school co-operation and choosing random samples of up to 18 former 1972 seniors per school and securing the last known address of those selected. This activity was successful in 204 of the 230 primary sample schools. Now we have slightly over 23,000 students representing 1,300 high schools.

In the spring of 1973 we did our first follow-up field test. It meant going from an administered instrument in the high school to a mail questionnaire. The questionnaire that was developed ended up to be 23 pages. Because of concern about its length, mail responses to a 12-page questionnaire were also tested with the result that there wasn't much difference in response rates. In addition to the length of the questionnaire, there were a number of items on aspirations and attitudes comprising long laundry lists, and we were wondering if the students would really fill these out. Fortunately, they did. Lastly, people kept saying, well if you are going to get the response rates that you need, you are going to have to use incentives. From a subsample of the 900 students, some were paid two dollars and others five dollars to fill out the questionnaire. Although there was some additional gain in responses, it was decided that it would not be cost effective. In the second follow-up field test, those students who had received incentive payment in the first follow-up field test responded equally as well or better. The fact that they were not offered a payment the second time didn't seem to make any difference in the response rates.

The first follow-up on the 23,000 sample was begun in October of 1973 with a 28-page questionnaire that included items relative to both October '72 and October '73 in order to develop a point in time reference. Questionnaire items in the spring of '72 had to do with ability, high school experience, plans, goals, self-concept, locus of control, academic performance and expectations. In October '72 the concentration was on defining their activity state, especially with respect to education and work. How they were financing their education that first year out

of school was also asked. In addition to defining activity state, October '73 also referenced their plans, goals, measures of self-concept and locus of control, so as to be able to assess how these were changing over time.

In initially planning the study, we set a goal of 60 per cent response rate by mail and an overall response rate of 90 per cent, expecting to attain the latter through personal interviews. We are currently meeting that goal. Some youths are lost because they refuse to continue participation, while others are moving around or are out of the country. However, that's what you have to contend with, and you just can't get all of them.

The procedures used in keeping track of the participants include sending out a newsletter and then tracing the nonrespondents by telephone. This can be done because each time they are surveyed, they are asked not only for their own address and phone number, but also for the address and phone number of two people who will know where they are. So far we have had good luck at tracing and finding these people.

The following are selected results of our efforts to date. In the spring of '72 the questionnaire asked what they planned to do during the first year after they were out of high school as defined by ten different activities. When the four activities relating to education are summarized, about 59 per cent planned to attend some kind of postsecondary education, 25 per cent were going to work full time, 2 per cent part time. The remaining categories of apprenticeship, military service, homemaker and other were between 3 and 4 per cent each. Comparing these plans with what has happened by October '72 and October '73, one discovers that 30 per cent actually attended a 4-year college. If we combine the two pursuits in junior college, academic and vocational, because we didn't break them out that way in the first follow-up questionnaire, there were 15 per cent attending in October '72 and 13 per cent in October '73. Those attending vocational technical trade schools amounted to 8 per cent and then dropped off to 5 per cent in October '73. Those working full time in October '72 were 30 per cent, and by October '73 it had increased to 39 per cent.

The next item of interest is in plans for the kinds of work the students were planning to do. Forty-four per cent were planning a professional career, 15 per cent clerical, 7 per cent craftsmen, 7 per cent technical, 4 per cent service, 3 per cent manager, and so on. By October '73, plans for entering the combined professional and technical occupations category had decreased from 51 to 43 per cent with BLS projecting only 16 per cent of the labor force needed in this category by 1980. The reverse is true for the craftsmen, service and semiskilled work categories. BLS has projected a 40 per cent need by 1980, but in 1973, roughly 13 per cent had indicated continuing plans to actually make these categories their lifework.

Yesterday reference was made to the change in what people are aspiring to know and what the needs are going to be in 1980. Let us consider other variables of interest along this line. Consider the students who were planning to work in the spring of 1972, by the kind of curriculum that they were taking in high school, and actually what they were doing in 1972 and '73. For example, most of the vocational people who planned to work actually did. But I think the important thing is that generally the slope of the trend lines depicting work and education activities by high school curriculum pretty much parallel each other over time. Furthermore, in October 1972, 55 per cent of the class of 1972 were still engaged in some form of postsecondary education while 45 per cent were working. One year later these percentages were almost exactly the reverse.

Another point of interest is the relationship of high school preparation for immediate employment categorized by high school curriculum and sex. The one thing that I would like to point out is that there are quite a few more females than males enrolled in the secondary vocational curriculum. We asked them if they had received any specialized training in preparing them for immediate employment. Only about half of the males answered affirmatively. Now, considering the general and academic curriculum in high school, we find that the sex differences are not as great, but in all cases the number of females getting jobs is larger than for males. It is also worth noting the use of high school training in a job as it relates to the specific high school curriculum. Again, the number of females in vocational curriculums who are making use of high school training in employment is much higher than males. Not being associated with vocational education, I found this rather surprising until looking at a breakdown by program areas. Three areas of vocational training are predominant: the business and office occupations with about 50 per cent, the technical fields (which the boys go into) accounted for 26 per cent, and distributive education, 10 per cent.

My final notation of interest pertains to asking the students about whether they had worked in a job where they expected to utilize their training. There were 59 per cent who had worked at jobs where they expected to use the training, 16 per cent looked for such work but couldn't find it, and 25 per cent had never looked for work where they could use the training. Of those who worked on jobs in areas where they could use their training, 71 per cent said they were able to apply almost everything they had learned in high school, 85 per cent were able to apply the basic principles, 32 per cent said they could have gotten the job without the training, 88 per cent considered the training a wise choice, and 32 per cent would have liked more information about what was expected in the job beyond skill training.

NLS is a broad data base, but the information and items of interest that I picked were chosen to illustrate the kinds of things that would be particularly applicable to the theme of this conference. In terms of the future of the study, the third follow-up is expected to begin in October '76. By that time information will be available about those who will have gone through a college program in four years. Subsequent follow-ups will trace their career development and contrast it with those who chose the world of work immediately following high school.

In summary, I have given you a broad overview of the National Longitudinal Study of the High School Class of 1972, and have identified some relevant data about occupational planning and outcomes to illustrate the potential use of the data base.

SELECTED OCCUPATIONAL SUPPLY/DEMAND STUDY: ALLIED HEALTH OCCUPATIONS*

Michael J. Pilot**

I would like to discuss briefly the prospective employment growth in the health services industry and present some selected supply/demand information on certain occupations based on our latest research. Also, I will outline some of the implications that national data has in assessing allied health education program needs for Pennsylvania.

The health services industry has been one of the nation's rapidly growing areas. The 1974 employment was about 5.6 million which is twice the level of 1960 (2.8 million). The projected 1985 level in the industry which is consistent with our published projections is as high as 7.9 million workers. The average annual rate of growth over the 1974-85 period is expected to be double the rate for the economy as a whole. We are now in the process of revising the 1985 projections, and the preliminary figures point to a likely adjustment upward to about 9 million workers in the health industry.

The delivery of health services care is evolving away from the in-patient type care with a lot of growth in the out-patient type clinics. Most of the additional growth for this year would be in that sector.

How do the supply/demand conditions in selected allied health occupations appear to be shaping up over the next 10 or so years? I would like to indicate a goal for some selected occupations and describe the occupational supply/demand. Even though the health industry is going to have a rapid growth, there is going to be a range of supply/demand conditions in the selected health occupations, some are going to be excellent in terms of the opportunities. The outlook is either questionable or we see indications where various fields are going to be highly competitive. The allied health, the dental area, all of these are going to continue to be fast growing. Even though there is going to be somewhat of a wide balance in supply/demand we would characterize this as good or favorable. Within the nursing area, registered nurses are approaching a balance situation. In some western geographic areas there is an oversupply of registered nurses. Licensed practical nurses area is still an area where you find shortages. In Pennsylvania there is quite an extensive health education system, and they should have no problems, in fact, I think they have more registered nurses than they have the licensed practical nurses. In the medical laboratory field, which for so long has been an area of very favorable employment opportunities, we see signs of oversupply. There are areas where this is already occurring in terms of employment opportunities. Specifically, the medical records field is a good example, and particularly we see some competition for those lacking degrees. The area of occupational therapy will continue to be fast growing. The outlook, as we see it, is going to continue to be good or the same in the physical therapy area. Dietitians is a rough balance, operating technicians is a good area, respiratory therapists is a possible oversupply. Based on their latest research, the supply information in that area is not that good and they are just sort of making an educated guess. The radiological technology field is heading into an oversupply situation. The opportunities continue to be best for all the people with the most training.

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*Presented from notes and compiled by the editor.

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Speech pathologists and audiologists, I noticed, is one of the major areas of training, at least in the four-year institutional system in Pennsylvania, along with nursing and medical laboratory work and I believe the social health area, for so long was a very favorable area, is showing signs of being competitive.

The results of some of this information I've just related to you appears in Occupational Manpower and Training Needs, which has been out about 5 or 6 months. It draws upon the research that goes into updating the Occupational Outlook Handbook. We present more statistical detail and it's also presented with the educational planner in mind. It presents our projections in terms of annual openings over this 1970-85 period. Together with this information are the sources where we've been able to find data, the current numbers of people being trained in various fields, how many are currently being trained so that you know what educational areas need to be expanded. This, is going to be revised, and will be consistent with the 76-77 edition of the handbook which will be out in November.

As far as the implications go, we see that while the health industries' projected experience shows strong growth, it's going to vary from surplus to shortage areas. We've seen this at least from a national vantage point. In the past I think anyone who has been responsible for implementing new educational programs, particularly in the allied health field, has had a fairly easy job. It's been a safe bet to implement programs. I think in the future you're going to need to increasingly scrutinize the data to determine what are going to be the promising occupational areas. Closer attention will have to be paid to regional, state, and local occupational supply-demand conditions. There also will be a greater need to monitor all sources of input on the supply side of the equation.

OVERVIEW OF OFFICE OF EDUCATION SUPPORTED PROJECTS IN PROGRAM PLANNING FOR MANPOWER INFORMATION AND SYSTEMS*

Glenn C. Boerrigter**

There are really two major areas that I wanted to cover this morning. First, I will briefly discuss the Office of Education's (OE) work with the Department of Labor (DOL); and then tell you what our Division of Research and Demonstration is supporting.

There has been a task force between OE and DOL for about the last year and a half and within six months there will be a written agreement between these two Departments. This agreement will result in a cooperative effort of revising the Vocational Education Occupations Handbook. This handbook, of course, relates to the Dictionary of Occupational Titles in the Department of Labor and to the Office of Education's Instructional Codes. This agreement is not only concerned with the revision of the handbook. In addition, a series of other kinds of cooperative and jointly sponsored activities are being proposed.

Moving to the Vocational Education research area, I will give you just a little background in terms of what and why we are supporting the type of projects that we are supporting in the Vocational Education Research program; the program that the Commissioner administers. The program is a state allotment program where the funds go to the geographical areas of the state. This type of discretionary program, of course, constrains the kinds of projects that we support. We tend to support projects that are of state significance. We support some projects that are of national significance, but a substantial number of projects are of state significance.

In FY 74 we supported an area called Manpower Information and Systems. This was one of the five priority areas that the Part C supported in FY 74. Under the manpower priority area we supported about 22 projects. Primarily, these projects were state-oriented projects. If you look at the projects on manpower, they are really state information systems projects. These projects were started in June 1974 and are 18 months in duration. Project investigators have 90 days after the end of the project to submit the final report, thus it will be another six months or so before we get the results. Nevertheless, in a few moments I will give you a little more background about a few of the projects.

In fiscal year 75, we changed our strategy somewhat. We indicated in the Federal Register that we wanted to support management information systems at the state level. If you look at the projects which we supported in FY 75 it can be ascertained that most of them have manpower information systems components built into them. In terms of what we are going to do in FY 76 remains to be seen.

One of the reasons that the vocational education research program supported manpower information systems projects was due to the Bureau of Occupational and Adult Education's concern that a number of states across the nation needed to "beef-up-their-capability" in this area. Some states have developed rather comprehensive manpower information systems, but others have not. I might add, that we have supported very little work, in terms of building that same kind of manpower information system capability at the local level. We probably should, but

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*Oral presentation given from notes and compiled by the editor.

**Director of Vocational Research Branch, Bureau of Occupational and Adult Education, U.S. Office of Education.

we have not approved many projects of that type. However, we did have a priority area in the improvement of the administration at the local level in vocational education this past year. I might add that the priority area did not fare very well. Perhaps this was due to lack of stimulation as well as other factors, but we really didn't support many exciting projects. At this point, I will give an overview of some of the Manpower and Information Systems projects that we supported in FY 74.

In Texas, they are developing a supply/demand information system. It will produce statewide projections related to occupations. It will have supply/demand statistics in groups of 250,000 people, and, also, it is designed to produce supply/demand data at the county level. In Oregon, they use manpower data in program planning, curriculum development, and counseling. In the State of Washington the project will attempt to translate federal and state forecasting information so that it's useful at the local level. It's pretty difficult to take it on down to the local level. In South Carolina they are matching job requirements with training skills, and they are getting manpower forecasts which will be utilized in curriculum development, etc. In Tennessee, they are attempting to build a regional system of vocational technical education. It will have manpower supply information, manpower demand information, etc. Dr. Lecht, your first speaker, from the Conference Board, reported on one of the projects that we supported. In terms of conserving time, I will just mention several projects that we supported that are of national significance. The North Carolina Occupational Center is attempting to identify the kinds of data that are needed at the national, the state and local levels. They are attempting to work with our Center for Statistics in the Assistant Secretary's Office. This group is conducting a follow-up study to determine what kinds of information are already available at the state level across the Nation.

We support project baseline. It is a four-year endeavor that collects existing data from the 50 states and territories as well as the Department of Labor and other federal agencies. This project is in its fourth year and in fact is now collecting the four-year data. The project baseline has subcontracted with an independent group to do an assessment of all four years of the data in relation to economic trends and social trends in order to get a better perspective about the status of vocational education.

The State of Maryland has a management of information system for vocational and technical education. It is my understanding that it is partially automated and includes an automated query system. I think the interesting thing about the system is the number and kinds of components that are included in this management information system, if you want to get some reasonably useable data out at the end. For example, one of the speakers this morning was critiqued in terms of, yes, you have certain kinds of data in your system--but have you really plugged in the important kinds of data? This type of question is always the difficult one to deal with. But reading through Maryland's program description system file, they have a student data system; completion system; program monitoring system; equipment inventory system; facilities; capacity and utilization system; financial system; cost; benefits analysis system; evaluation system and employment data system. Then other information is included in the system--state economic development data, employment security data, state department of education planning data, research and evaluation information data, local planning information and advisory counsel information.

I think there are other major factors that need to be included in a management information system. Most of these items, at one time or another, have already been mentioned at this conference. One of them is obviously keeping abreast of employment, unemployment and underemployment kinds of data.

Another factor that needs to be utilized in decision-making, if not in the infor-

mation system, are the goals of the state or of local school districts. This is extremely important and the failure to do so may be the reason we have a different perception of problems at the local level. Often there are a completely different set of goals and objectives at the federal, state and local levels. We heard some pretty good discussions this morning about this problem. There were completely different philosophies, and we never really hammer these out. Well, the other kind of thing that obviously has to be mentioned is the labor market barriers. Job requirements, impact of technology; we can go a couple of ways on this one, but we can't just throw it out. Technological advances have been made and therefore we need more highly trained people. Yet, I see technology used in the computer area, for example, as a means of requiring less skilled people. They are using technology to reduce the required numbers of highly qualified people; so now we are moving into the area of really divergent kinds of planning.

Another interesting fact that has little to do with manpower, I suppose, but I would just like to relate it. I have been in the Office of Education for a number of years, but when I first came in discussions about functional literacy in society were heard. These discussions indicated that a fourth grade reading level was required. Now I hear discussions which set the literacy reading standard at the 10th-grade level. What are educational implications of such a rapid change? I suspect, the problem of functioning in society is not entirely job-oriented. In any event, all of a sudden the reading requirement, according to some experts, has gone up to tenth grade. How many persons can we actually train or educate to the 10th-grade reading level. It's a tough problem to think about. I can think of other kinds of management problems, and these are the ones that really hit us once in a while. For example, the energy problem; what does it do to all of our plans. It will probably put us into a completely different mental state. I don't think we have really faced up to it or know how to handle it.

Finally, you can develop comprehensive management information systems that are "good", at the state level, but that doesn't necessarily answer the problem. We need coordination from state to state. So even if we develop the best management information system at the state level, it really wouldn't answer the nations problems. The problems are bigger than that.

Finally, the original topic, for this part of the program was something like, "Is manpower planning needed for vocational education at the secondary level." The answer is, yes, we need it. I think this is fairly obvious. And we badly need it. However, I believe, it's also fairly obvious that no matter how sophisticated we develop our management information systems, these systems are going to be more accurate at the macro level than at the micro level. Maybe some day we will be able to produce very finite pieces of information and have confidence in them over a sustained period of time, but we have not yet reached that level of sophistication.

IV

MANPOWER RESEARCH AND INFORMATION FOR HIGHER EDUCATION (VOCATIONAL, PROFESSIONAL)

In the third group session a number of controversial issues were raised in regards to higher education and manpower research. A major concern was whether higher education planning should use occupational supply/demand data as a critical variable for determining program offerings.

Specific attention was given to graduate follow-up studies. Although it was evident that much valuable data could be obtained, many questions were raised how best to use the resulting data and information. One question raised was whether it should be used for student career guidance and planning, higher education program planning, both or neither.

Reactions in regard to planning as it relates to the liberal arts approach versus the occupational orientation continues to stir controversy and it appears that differences of opinion remain very strong. Repeated emphasis was given to the need for effective occupational information delivery systems. Also, it was stressed that there needs to be attention given to the development or improvement of job searching information and instruction. And that it should be a part of the existing curricula.

A STUDY OF BACCALAUREATE ENGINEERING DEMAND AND SUPPLY IN PENNSYLVANIA: METHODOLOGY AND FINDINGS

George E. Brehman, Jr.*

This study attempts to assess the demand for and supply of baccalaureate-degree engineers for Pennsylvania during the period of 1975 to 1983 with some analysis of the implications of the declining birthrate for demand and supply beyond 1983.

The study reveals a current (1975) shortage for all types of engineers and a considerable long-term shortage until 1983 because of Pennsylvania's probable response to the energy crisis. The greatest need, numerically, will be for more electrical-electronics engineers, mechanical engineers, industrial engineers and chemical engineers than will probably be graduated between 1975 and 1983.

In addition, there will be a marked increase in demand for highly specialized types of engineers--especially those related to nuclear power generation and energy production and those needed to improve health services and food production (e.g., biomedical, health systems, aquaculture and mining).

The long-term decline in the number of college-age youth projected here indicates a severe and deepening shortage of trained engineers beyond 1983 unless we can more effectively recruit such groups as women and minorities. Aptitudinal and motivational requirements for the satisfactory completion of an engineering curriculum place real constraints on the number who can be recruited and graduated. In addition, every effort should be made to make engineering education as efficient as possible to reduce the relatively high dropout rates historically associated with engineering as a major.

In this report some consideration is also given to obsolescence and the role that industry and the schools of engineering may play in reducing it. The point is made that discarding the "obsolescent" engineer is a waste of human resources. It indicates a prevailing concept of the engineer as inflexible and not readily susceptible to job retraining or effective transfer of his/her knowledge and skills to a new type of work. If true, it suggests that our engineering curricula needs to be re-evaluated as to its preparation of engineers in terms of training for flexibility in an age of rapid technological progress and change since the engineer, by definition, has demonstrated that he is an effective learner in that he has successfully completed a baccalaureate or a graduate degree.

A far greater emphasis on in-service and continued education will have to be made, by industry and the schools of engineering, to prevent an excessively high rate of "quality substitution" in the face of shortages despite a simultaneous pattern of unemployment for older "obsolescent" degree-holding engineers. Historically industry has always employed less qualified substitutes when degree-holding engineers were in short supply. This may prove a less adequate expedient in the face of the long-term dwindling of engineer-degree supply foreseen for at least the next quarter of a century.

The response to the energy crisis is seen as really getting underway in 1976 and as sharply increasing our need for mining, petroleum, electrical, mechanical, industrial, civil and, to some degree, chemical engineers over and above the needs

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that would have been otherwise projected. Nuclear engineering is also expected to be a very high need area, with food-related and health-related engineering also coming to the fore.

A discussion of the limitations of the study is given, e.g., national-based estimates of out-migration, arbitrary residual estimates of the rate of in-migration, the assumption that Pennsylvania's response to the energy crisis will be much the same as projected for the nation.

The projections in this study are reasoned estimates of what will occur, given certain assumptions. They are not prophecies or predictions. Events such as war, severe depression, radical shifts in government priorities, etc., can change the ultimate outcome as well as any efforts made by the State of Pennsylvania to reduce the shortages now foreseen.

The need is seen not as one of a lack of facilities to train engineers but rather as a problem of recruiting. What is needed is an adequate number of students to meet the projected needs despite a possible period of declining interest in science and engineering along with a continued decline in mathematical aptitude and science achievement scores.

Table 17

Computation of Energy Crisis Modified 1980 Growth Using the National Estimates of the National Planning Association

Field of Engineering	1970 Census[a]	1970 Energy Sector Employment[b]	1970 Non-Energy Employment	Projected 1980 Energy Sector Growth[c]	Projected 1980 Non-Energy Sector Growth[d]	Projected 1980 Energy Corrected Growth[e]	1970-80 Energy Corrected Percentage Growth
				%	%		
Aero-Astronautical	1,500	5	1,495	00.00	20.00	1,800	20.00
Chemical	3,918	625	3,293	25.89	- 4.13	3,944	0.66
Civil	9,288	3,385	5,903	28.14	18.40	11,327	21.95
Electrical-Electronic	15,178	1,778	13,400	95.31	17.60	19,231	26.70
Industrial	12,467	458	12,009	45.00	21.98	15,313	22.83
Mechanical	11,208	1,117	10,091	148.75	5.33	13,428	19.81
Metallurgical and Materials	2,228	60	2,168	111.11	6.37	2,433	9.20
Mining	330	137	193	100.00	1.21	469	42.12
Petroleum	88	55	33	30.36	12.50	109	23.86
Sales	4,784	182	4,602	111.11	- 1.65	4,910	2.63
Other, n.e.c.	12,565	680	11,885	162.16	28.16	17,015	35.42
All Engineers	73,554	8,482	65,072	66.34	15.63	89,352 89,979[f]	21.48 22.33

[a]Non-response allocated estimates developed by the U.S. Bureau of Labor Statistics for Pennsylvania projections using a modification of Method B from Tomorrow's Manpower Needs (See Table 8).

[b]Derived from the allocated 1970 figures of BLS using only those sectors of industry that are energy related, i.e., electric power generation, transmission and distribution; petroleum and natural gas extraction and refining; natural gas production, transmission and distribution; coal mining; nuclear power production and radioactive waste disposal; manufactures of selected durable equipment for electric companies and energy-related construction (See Table 16).

[c]Derived from projections of national growth listed in note b as found in The Demand for Scientific and Technical Manpower in Selected Energy-Related Industries, 1970-1985: A Methodology Applied to a Selected Scenario of Energy Output. A Summary by Ivars Gutmanis of the National Planning Association for the National Science Foundation.

[d]Derived from the 1970-80 projections of Table 8.

[e]Computed by applying the appropriate growth rates to the energy sector and non-energy sector figures for 1970 and summing the two, e.g., for chemical engineering, 625 x 0.9587 + 3,293 x 1.2589 = 3,944 and for civil engineering, 3,385 x 1.2814 + 5,903 x 1.1840 = 11,327. The 1980 estimate was left at 1,800 rather than 1,799 as computed.

[f]The actual total of the separate estimates. This total will be used later, since the nonenergy growth rates include the growth estimates for the energy-related sectors before the energy crisis and may be lower than would be the case if these sectors had been removed.

Table 19

Conversion of 1970 and 1980 Energy Crisis Modified Projections of Employed Engineers to Estimates of Employed Engineers Holding a Bachelor's or Higher Degree in Pennsylvania

Field of Engineering	B.S. Conversion Ratio[b]	Total Employed 1970[e]	Projected Energy Crisis Employed 1980[f]	Estimated B.S. Holders 1970	Energy Crisis Estimate of B.S. Holders 1980
Aero-Astronautical	0.67	1,500	1,800	1,005	1,206
Chemical	0.85	3,918	3,944	3,330	3,352
Civil	0.60	9,288	11,327	5,573	6,796
Electrical-Electronic	0.64	15,178	19,231	9,714	12,308
Industrial	0.51	12,467	15,313	6,358	7,810
Mechanical	0.61	11,208	13,428	6,837	8,191
Metallurgical and Materials	0.72	2,228	2,433	1,604	1,752
Mining	0.80[c]	330	469	264	375
Petroleum	0.80[c]	88	109	70	87
Sales	0.55	4,784	4,910	2,631	2,701
Other, n.e.c.	0.62	12,565	17,015	7,790	10,549
All Engineers[a]	0.61[d]	73,554	89,979	45,176	55,127

[a]All entries in this row are summations of the column entries with the exception of the B.S. conversion ratio of 0.61.

[b]Derived from national figures taken from a postcensal survey of engineers as found in Table 9 of this report.

[c]Mining and petroleum engineers were combined in the postcensal study of note b above. The same ratio was, therefore, used for both although there may be a difference between them with regard to the proportion of degree holders.

[d]An actual result obtained by dividing 45,176 by 73,554 and 55,127 by 89,985 is 0.61 in each instance when rounded to two decimals. The postcensal survey of note b above gives this figure as 0.62 but a decision was made to use the obtained figure rather than allocate.

[e]See Table 18.

Table 29

Final Projections of the Number and Retention of Engineering Graduates to the Year 1987

Base Year	Graduation Year	Projected Freshmen/ Sophomore[a]	Projected Graduates[d]	Projections of Graduates Retained in Pa.[e]
1970	1974	3,769[b]	2,362[b]	1,148
1971	1975	3,434	2,152	1,046
1972	1976	2,821	1,768	859
1973	1977	2,387[c]	1,496	727
1974	1978	2,882	1,806	878
1975	1979	3,523	2,208	1,073
1976	1980	3,821	2,395	1,164
1977	1981	3,954	2,478	1,204
1978	1982	4,260	2,670	1,298
1979	1983	4,394	2,754	1,338
1980	1984	4,231	2,652	1,289
1981	1985	4,145	2,598	1,263
1982	1986	4,075	2,554	1,241
1983	1987	3,836	2,404	1,168

[a]Projections of the number of freshmen in engineering programs or, in the case of five-year programs, of sophomores in engineering.

[b]Underlined figures are from Table 25.

[c]Figures from this point down are from Table 28 in which projections of the number of freshman/sophomore enrollments have been made based upon a supposed reversal in engineering enrollments as a proportion of all four-year college enrollments.

[d]Figures in this column are derived from the first column according to the rate of 0.6268 from Table 25.

[e]Based upon a ratio of 0.486 derived from detailed data on engineers supplied by William Toombs and derived by him from raw data used in preparing his report entitled The Comm-Bacc Study: Postbaccalaureate Activities of Degree Recipients from Pennsylvania Institutions 1971-72, Report No. 23, Center for the Study of Higher Education, The Pennsylvania State University, August 1973. See Table 24 of this report for the computation of the ratio.

Table 35

Reallocated Projections of Engineering Baccalaureate Graduates by Degree Field Based Upon Energy Crisis Induced Growth in Mining Engineering[a]

Year	Aero-Astro-nautical	Chem-ical	Civil	Electrical-Electronic	Indus-trial	Mechan-ical	Metallur-gical & Materials	Mining	Petro-leum	Others n.e.c.	All Combined
1974	33	281	406	672	145	519	138	16	26	126	2,362
1975	30	256	370	612	132	473	126	15	24	114	2,152
1976	25	210	304	503	108	389	103	12	20	94	1,768
1977	21	176	254	422	91	326	86	25	17	78	1,496
1978	25	213	308	509	110	393	104	29	20	95	1,806
1979	31	260	376	622	134	482	128	35	24	116	2,208
1980	34	282	408	675	146	522	139	37	26	126	2,395
1981	35	292	422	699	150	540	144	39	27	130	2,478
1982	38	315	455	753	161	582	155	41	29	141	2,670
1983	39	325	470	776	166	600	160	43	30	145	2,754
Total 1974-83	311	2,610	3,773	6,243	1,343	4,826	1,283	292	243	1,165	22,089

[a]Derived from Table 34 by assuming the growth pattern for mining engineering in note c of that table and the all combined figures to be given and by reapportioning the other degree field figures accordingly.

Table 36

Projections of Engineering Baccalaureate Graduates Retained in Each Degree Field by Year of Graduation[a]

Year	Aero-Astro-nautical	Chem-ical	Civil	Electrical-Electronic	Indus-trial	Mechan-ical	Metallur-gical & Materials	Mining	Petro-leum[c]	Others n.e.c.	All Combined
1974	14	133	163	337	77	275	82	5	9	54	1,148
1975	13	121	149	306	70	250	75	5	8	48	1,046
1976	11	99	122	252	57	206	61	4	7	40	859
1977	9	83	102	212	49	173	52	8	6	33	727
1978	11	102	124	256	58	209	61	10	7	40	878
1979	13	124	151	313	71	255	76	12	8	50	1,073
1980	15	135	164	339	78	277	82	12	9	53	1,164
1981	15	140	170	351	80	286	85	13	9	55	1,204
1982	16	150	183	379	86	309	92	14	10	60	1,298
1983	17	155	189	390	89	318	95	14	10	61	1,338
Total 1974-83	134	1,242	1,517	3,135	715	2,588	761	97	83	493	10,735
Retention Rate[b]	0.429	0.482	0.407	0.508	0.540	0.536	0.600	0.333	0.333	0.427	0.486

[a]Derived from Table 35 where the retention in Pennsylvania rates from Table 24 are multiplied times the projected graduates of Table 35. The resulting row values added up to a larger figure than the all combined estimate. The entries were, therefore, modified proportionately to add up to the "all combined" entry figure in the last column.

[b]Retention rates taken from Table 24, which summarizes an analysis of Comm-Bacc survey findings on engineers as supplied by William Toombs of the Pennsylvania State University.

[c]It is assumed here that, despite petroleum being included with chemical engineering by Toombs, the actual retention rate is more likely to be like that for mining. A rate of 0.333 was, therefore, used rather than the figure of 0.482 for petroleum and chemical engineers combined. Only eight per cent of the chemical and petroleum engineers would be petroleum engineers in any case, putting the 0.482 figure automatically in doubt as representative of petroleum degree graduates.

Table 60

A Summary of Projected Unmet Need Findings for Pennsylvania Assuming a Response to the Energy Crisis as of 1976[a]

Engineering Specialty	1975	1976	1977	1978	1979	1980	1981	1982	1983	Total
Astro-Aeronautical	32	34	38	36	35	34	34	35	35	319
Chemical	27	81	98	79	58	48	43	35	30	499
Civil	3	68	91	73	50	40	39	29	27	420
Electrical-Electronic	44	263	318	287	246	235	238	228	232	2,091
Industrial	24	49	58	52	41	36	36	32	33	361
Mechanical	69	301	349	324	292	284	289	281	308	2,497
Metallurgical/Materials	12	36	45	39	24	19	16	12	10	213
Mining	1	21	17	17	17	17	18	18	20	146
Petroleum	4	7	9	6	8	7	8	7	6	62
Other[b]	22	158	173	178	174	180	190	194	181	1,444
All Combined	238	1,018	1,196	1,091	945	900	911	871	882	8,052

[a]Based upon Tables 48-57.

[b]Entries modified to reflect the difference between the all-combined entry and the total of the unmet need figures in the column rather than the unmet need entries of Table 58.

CAREERS, PLANS AND EMPLOYMENT OUTCOMES OF COLLEGE GRADUATES

Jean G. Kessler*

To try to acquit my assignment for this very timely symposium, I will be describing some of the research which the College Placement Council and its related orgainzation, the CPC Foundation, have funded in the area of career plans and employment outcomes of college graduates. I will also note some of the implications and value for educational decision-making. Before I start, I want to point out that I am not a researcher, although I have been very involved with these projects. The principal investigator, Ann Bisconti, is on her way to Italy with her family where they will make their home for the next few years. I will try to do her work justice, however I will not be able to respond to questions about the technical aspects of the research.

CPC's first involvement with this particular research came about because of its interest in college-educated personnel and its lack of funds to do original research. Looking around for a good data base which would be available for secondary analysis, it came upon the data bank developed by the Research Division of the American Council on Education, headed by Alexander Astin. The Cooperative Institutional Research Program, more commonly called CIRP, had been initiated in 1965 by ACE, primarily to provide information on demographic characteristics, past academic achievements and experiences, and future educational and vocational plans, ideology, and life goals of college students. A questionnaire covering these areas was, and still is, administered each year to freshmen at about 300 institutions selected by a stratified design. The stratification variables are:

- type of institution
- size
- control
- selectivity, that is, number of qualifying applicants vs. number of acceptances
- affluence (total revenues in dollars per student), and
- traditionally black vs. traditionally white

All the data are weighted for disproportionate sampling in order to approximate the universe of the college freshmen population. Probably many of you are familiar with the annual national norms for entering college freshmen resulting from this program.

At the time of CPC's interest in the data bank, follow-up surveys had also been administered in 1966 to the 1965 bachelor's recipients and in 1970 to the 1970 bachelor's recipients. In both follow-ups, only those graduates who had responded to the freshmen surveys of 1961 and 1966 were included. CPC Foundation funding made possible an investigation of these data in terms of the career plans of these two college classes, with analyses covering the shifts in career plans from the freshmen to the senior year and the actual initial employment outcome. Differences between the two classes were also examined.

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While this research was being undertaken, another follow-up study of the freshmen of 1961 was undertaken in 1971 by CIRP for the National Institutes of Health and the National Science Foundation. Again, the CPC Foundation funded secondary analyses of those areas covering the relationship of career plans to employment outcomes. Three monographs will result from the investigation of these data. The first was released about a month ago. The other two are in the final stages of completion. The first is a review of the career development and employment outcomes of the 1961 freshman cohort, many of whom had been working since graduation in 1965. The second will focus on the career outcomes of the liberal arts graduates in this cohort, and compare them with those in nonliberal arts fields. The third will discuss the career patterns of those men and women who took employment in private companies as compared with those in other settings.

Again, before these studies could be published, an opportunity arose to collaborate with the National Institute of Education in a fourth survey of the 1961 freshmen to determine how they had utilized their education in employment.

This is a very long way of explaining that these CPC Foundation studies, when completed, will track the 1961 freshman class from its entry into college up through 1974, a period of 13 years, tracing the changes in career plans, as well as the links between major fields of study, career choice, and employment outcomes, covering as many as nine years of actual work experience. In all of the follow-up surveys, only those students--or graduates--were included who had answered all of the previous questionnaires. Additionally, for most of the 1971 and 1974 analyses only those were included who had received a baccalaureate but not a higher degree.

This continuing study of the same cohort has provided unusual insight into the career decision-making process and into the relationship of education to employment actualization.

Major findings of the 1966 and 1970 studies of 1965 and 1970 graduates showed suprisingly similar career plans between the two classes. Freshmen career plans were found to be good predictors of senior-year outcomes, although considerable shifting was found to occur during the college years. For men in both classes, these shifts tended to be into the more prestigious occupations, with business executive attracting men graduates with a wide variety of freshmen-year interests. The career fields with the most stability for male graduates were business (other than clerical and sales), teaching, ministry, and the professions.

Women in both classes presented an altogether different picture from the men. Nearly half of each class planned to teach at the elementary or secondary level. The only other careers attracting close to 10 per cent of the women were the non-medical health professions and the natural or social sciences. The relatively small number of women who were initially attracted to the more masculine-associated careers tended to change their plans, many gravitating toward teaching. However, women with initial interest in engineering continued to select highly demanding, related careers, such as physical scientist or college professor.

The 1971 follow-up reemphasized many of the previous findings regarding changes in career plans and choices of occupations. Men graduates were again found to be distributed throughout the occupational spectrum, with the largest proportions in business administration (13 per cent), elementary and secondary teaching (17 per cent) and engineering (10 per cent). Women, on the other hand, were clustered in a single career area: almost 50 per cent were in teaching, 43 per cent at the elementary or secondary level and, six per cent at the college level.

Additionally, the investigations found that:

° By 1971 barely half of the graduates were employed in the occupations they planned to enter in 1965. The proportions of graduates within occupations were quite similar to the proportions who, in 1965, planned to enter these occupations, however much shifting occurred within clusters of occupations which were linked by similarities in curricula and vocational interest.

° Graduates tended to shift into business-related careers from the entire occupational spectrum, resulting in actual employment in business careers in 1971 surpassing 1965 expectations.

° The more rigorous or more specialized occupations such as the sciences and professions lost in numbers. Additionally, recruitment into these careers became more difficult over time. Those with low grades were especially unlikely to persist in the rigorous fields.

° Occupations requiring specialized training drew graduates primarily from a single source. For example, among men, 87 per cent of the engineers majored in engineering whereas nearly two-thirds of the business administrators did not major in business and four-fifths of the school teachers did not major in education. The occupational pools for both of these were derived, in large part, from the liberal arts disciplines.

° Retention in the professions and sciences was much higher for men than for women. Only nine per cent of the women who originally planned to become either engineers or natural scientists were employed in these occupations in 1971. Those women who eventually became natural scientists were more likely to have aspired to a medical than a scientist career.

° Almost three-fourths of the women who planned to become engineers and half of those who planned to become natural scientists were employed in business-related occupations.

° Other links between certain majors and careers were also observed. Physical sciences were a large contributor to the supply of computer personnel and engineers, while the social sciences contributed substantially to the supply of business administrators. Moreover, the business-law relationship was reciprocal.

° Overall, for both sexes, the disparities between plans and outcomes favored occupational categories that can cover a broad range of work activities and academic disciplines.

° Educational settings drew the largest proportion of graduates--35 per cent. Private companies were next, attracting 29 per cent. Of these, 11 per cent were employed in manufacturing and mining, four per cent in retail and wholesale businesses, and 14 per cent in other types of companies in the private sector. Government was the next largest employer, with 11 per cent of these graduates.

° Percentage-wise more than twice as many men as women were employed in private companies (35 per cent vs. 16 per cent). The opposite was the case for educational settings (54 per cent women vs. 26 per cent men), while government attracted almost equal proportions of men and women.

° People in various occupations differed with respect to the importance they attributed to certain job features which influenced their career choice. In some cases, the findings supported popular stereotypes. Both men and women in

business-related occupations indicated that high earnings, opportunities for advancement, and leadership were important factors in their career choice. Many doctors and lawyers attributed importance to high earnings, occupational prestige, the chance to make a contribution to society, and an intrinsic interest in their field. Teachers, social scientists, and other professionals, as expected, were attracted by an opportunity to make a contribution to society.

° Business administrators, lawyers, doctors, and social scientists were likely to rate themselves above average on leadership. Lawyers, doctors, and college teachers were the most intellectually self-confident.

° Although women were higher achievers than men in college in almost every occupational category, women's self-ratings were generally lower than those of men. However, in traditionally male-dominated occupations, such as business administrator, engineer, health professional and lawyer, women held a more positive self-concept than men. It is possible that their positive self-image was a factor in their persistence within these careers.

° The actual career decision was often influenced by husbands and wives. Spouses were particularly influential for business administrators, engineers, and lawyers. Scientists and college teachers were influenced additionally by professors or faculty advisors, and doctors by parents.

The 1974 findings, which are only in the preliminary stage, again confirm many of the findings of the earlier reports about the 1961 freshmen cohort.

Over half the class chose their career either at graduation or in subsequent years. Many have ended up in private companies (53 per cent) and in business careers (38 per cent), although only 18 per cent majored in business. Forty per cent of the women are teachers. About two-thirds of the men have policy or decision-making responsibility and about two-thirds consider their job professional. Three-fourths of the women consider their job professional, but less than half have policy or decision-making responsibility.

As mentioned previously, the primary purpose of the 1974 follow-up was to investigate the usefulness and utilization of education in employment. At the very least, college education is expected to enhance one's general knowledge and ability to think clearly, even if this knowledge and ability are not put to use in paid employment. These purposes apparently were accomplished to some extent for almost all respondents. Seventy-three per cent rated their education "very useful" in providing general knowledge, however only 43 per cent said it increased their ability to think clearly. Over half, 58 per cent, reported that college was only somewhat or not at all helpful in providing a skill that enabled them to get their first job, but almost all felt that it increased to some extent their chances of finding a good job. These responses suggest the graduates believe it was the degree, not specific skills, that helped them in their job search. However, 88 per cent reported that their education was at least somewhat useful in providing "knowledge and skills that I use in my current job."

Some striking differences appeared when these findings were examined by field of study. For comparison purposes the various majors were classified broadly as Liberal (composed of English, arts and humanities, and social sciences), Scientific (made up of the natural sciences, mathematics, and economics), and Vocational (which included business, education, and engineering). Persons from all three types of majors gave similar ratings to their education for providing general knowledge and fostering the ability to think clearly, but those in Liberal majors were much less likely than others to reap career benefits. Only 27 per cent in

Liberal majors (compared with 37 per cent in Scientific majors and 46 per cent in Vocational majors) rated their college education "very useful in giving me knowledge and skills that I use in my current job."

Another measure of usefulness is the relatedness of the substance of undergraduate education to jobs. In addition to applying the traditional approach of comparing the titles of majors and occupations, several questions were asked regarding relatedness. One question asked respondents to judge whether their job is "closely, somewhat, or not at all related" to their major. Almost half (46 per cent) consider their major and job "closely related," 27 per cent said "somewhat," and 26 per cent "not at all" related. Not surprisingly, the highest proportion of graduates who perceive their job to be closely related to their major is observed for Vocational fields--the lowest for Liberal fields.

Most of the men and women in this class whose jobs were only somewhat or not at all related to their major, had left their field of their own volition. Among the reasons given by one-fifth or more of the "defectors" were "found a job that offers a better chance for career advancement," "first job was unrelated to major field and I became interested in this type of work," "prefer line of work that is not closely related," "found a better paying job," and "never planned to take a closely related job." Only nine per cent said that they "could not get a closely related job but would prefer one."

Men and women in social sciences and women in arts and humanities were most likely to report involuntary reasons for not working in a closely related job. The problem appears to have been the limited number of jobs that are closely related to these majors as well as a scarcity of openings.

Looking at the job satisfaction of these men and women, it was found that it is not the extent to which college education is related to jobs but the reason for lack of relatedness that makes the difference. Those who left their fields voluntarily were just as satisfied as those in closely related jobs, but men and women who were pushed out--because of lack of job openings or some other reason--were less satisfied. About 60 per cent of those in closely related jobs or who left their fields voluntarily--but only about 30 per cent of those who left involuntarily--were "very satisfied." This finding is particularly significant for today's students because the unfavorable job market will probably increase the numbers of involuntary defectors. Thus, it is reasonable to expect increasing dissatisfaction among college-educated workers.

The quality of the job also seemed to be much more important to job satisfaction than the relationship of job to major. High salary, perceiving that one's job is professional level, and feeling that one's skills are fully utilized appeared to be important factors. (Their relative importance will be examined further as additional data from the survey become available from the computer.)

Although I have only touched on the findings of the 1971 data, and the 1974 study is still in the preliminary stages, it is obvious that the links between career plans, education, and employment outcomes are very complex. People assess the value of their college education in many different ways, but its usefulness in career development is one of the most important. Additionally, these studies indicate that people assess the relatedness of education and employment more on the basis of their perception that the content of their major is being used than on the basis of any literal match between the two.

The 1974 survey also indicates that a lot of education is not being used in careers. With rising consumerism on campus--with students increasingly holding

their colleges and universities accountable for justifying the high investment in time and tuition--there is a need for colleges to encourage students to define their objectives and to help them achieve these objectives.

To this end, the following major findings appear to have vital implications not only for career counselors, but also for curriculum planners, faculty, and educational administrators generally:

First, the substantial disparity between career plans during college and actual employment outcomes. This includes:

... Shifting within clusters of occupations with similarities in curricula and in vocational interest.

... Relationships between majors and occupations.

... Retention problems in more rigorous or specialized occupations, particularly for women for whom sex stereotypes are still very prevalent.

... Relationship of career choice and personal values, self-concept and the influence of others.

... The gain in numbers over time by those occupational categories that cover a broad range of work activities and academic disciplines.

Secondly, the timing of actual career choice by over 50 per cent of the respondents after graduation, not before or during the college years.

Third, the ratings on the usefulness and utilization of education in employment, particularly the differences among graduates from the various fields of study.

Fourth, the reasons for job satisfaction and dissatisfaction. During the week of May 27-30 the College Placement Council sponsored a national meeting in Washington, D.C. on the subject "Education and Careers--A National Re-examination." Those in attendance heard many eminent speakers.

I was particularly struck by two statements: One made by Frank Newman, president of the University of Rhode Island and chairperson of the Task Force on Reform in Education, and the other by Arnold Weber, a former Undersecretary of Labor for Manpower and now provost and dean of the Graduate School of Industrial Administration at Carnegie-Mellon University. Mr. Newman pointed out that there are many possibilities for careers not yet known at this time and stressed the need for education and skills that are transferable. Mr. Weber spoke of the supply and demand situation which is currently facing new college graduates and which will continue into the 1980s. He suggested that there should be more concentration on horizontal movement within related career fields rather than the more traditional concept of vertical movement in a single field. In his remarks last evening, Mr. Pittenger, too, talked about the "cluster" concept of related fields.

Both of these ideas suggest a need for change in the traditional approach to choice of undergraduate major and in career planning. Knowledge of the interaction of all of the factors involved in the complex relationships of the career decision-making process will be essential to such change. The more educators and counselors know about the relationship and utilization of education in employment, the better equipped they will be to assist students in making viable choices, or at least to understand the implications of their choices for their future development. Ongoing research can play a vital role in providing this knowledge.

FIRST YEAR OUT: DELAYED ENTRY DECISIONS*

William E. Toombs**

Introduction

This is an exploratory study of the process of adjusting to what can be called "delayed entry into the labor force." Within the whole professional memory span of most persons in this audience, it has been possible to treat such delays as temporary aberrations, short term departures from a normal condition of smooth flow from training to work. However, over the past five years there have been disruptions in the entry process for just about every major professional occupation group identified with high levels of education: teachers, military officers, engineers, neurosurgeons, accountants. And they have appeared at all levels--baccalaureate, masters, doctors--with the result that moving toward more study postpones but does not answer the inherent questions. When this indication is combined with the data on labor force trends, it signals continuing importance for the phenomenon of delayed entry.

My approach to the topic is put in clear perspective by Ruth Mack in the early pages of her book Planning on Uncertainty (New York, 1971): "At the start of any serious investigation it is necessary to choose whether one intends to be the prey of the answers or of questions. If one elects to submit to the demands of answers, the questions must be such as to permit tidy (however complicated) answers. If, on the other hand, the material is given free rein to find its way to the central questions, the answers will inevitably be less neat." In this study we are clearly hostage to the questions. It is preliminary in scope, content, and analysis. Even casual reading of the professional literature today lends substance to an observation of Professor John Holland made last fall that the relationship between higher education and society is undergoing change "on a large scale." That aspect of change which treats the relationship between advanced education and work has developed many significant facets: projections of supply/demand data, the changing occupational structure, declines in the capitalized value of a college education, qualitative shifts in primary life values away from work activity. Questions of educational policy spring from every one of these topics. Somehow colleges and universities must meet change at the first frontier, committing their resources in advance to programs that will fit reality in a future that is at least four years away. So the question under address here is, frankly educational, "What does the delayed entry phenomenon hold for educational planning at the undergraduate level?"

Setting

Systematic examination of the relationship between a person's education and career choice is a relatively recent endeavor, much of it dating back less than 25 years. It has been a fruitful quarter century. A literature has grown up that is rich in theory, well supported by both experimental and non-experimental research, and linked to psychology and sociology. Even more remarkable is the amount of this thinking that has been incorporated into educational organization and practice, not only in the specialized field of guidance, but also in program designs. The central theme is career development, the process by which individuals identify themselves, in behavior as well as thought, with a particular area of work activity. The notion of job preference as a product of a recognizable process of growth and development

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*Note preliminary data: not for quotation or citation.

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originated in the work of Ginzberg (1951) and Super (1957). It leads to concepts like "vocational maturity" (Tiedeman 1961) and stages of development. More subtle linkages have been explored in the psychological tradition, notably between self-concepts and job preference (Super 1963), but leading to a view that career choice is an expression of personality (Holland 1966). The process of career development can be interpreted as a series of decision points and this idea has been especially useful in counseling. Examination of trade-offs and exchanges in terms of probability factors is the next-stage in theoretical development. Behind this extensive development are several ideas that bear noting. Individuals shape their own lives by decisions and those decisions are improved by having better information of all kinds at one's disposal.

When career development theory was in its early stages there was considerable recognition of externalities in the situation. "The occupational preferences that finally crystallize do not directly determine occupational entry. When they can be realized, or must be modified or even set aside, depends on . . . selectors. . . qualifications. . . and other factors which are beyond his (or her) control and which may even be unknown to him such as economic conditions and employment policies." (Blau et al, 1959). Gradually this aspect of career development has been replaced by the convenient but unexamined assumption that educated persons will move without delay into the skilled and professional labor force at a level commensurate with a collegiate preparation. Larkin (1970) summarized it well ". . .The American system encourages a continuous, flexible, and relatively easy adjustment of trained manpower to supply and demand." Postulates to this untested axiom emphasize the importance of making a firm career choice as opposed to an uncertain one and the consequent value of preparing for the specific career one has chosen. The implied proposition is that individual interests, abilities, and action determine the job outcome. The most complete expression of these ideas is ably stated in the recent work of Marland (1974) who introduced them into the framework of national policy.

If we take time to look, we find quite a few other practices, policies, and attitudes are based on this notion of entry without delay into the vocation of your choice. Student aid programs, both state and federal, have relied more and more on loans. Repayment of such loans is heavily contingent on employment after graduation and any delay interposes other financial requirements that cause individuals to postpone repayment. There is more logic than dereliction in the high defalcation rates of recent years, years of delayed entry and underemployment. Logic suggests, too, that some of the enrollment slowdown is due to a drop in expectations that education leads to better jobs immediately, expectations that should never have been encouraged.

Not only has the assumption of no delay generated questionable practices and policies, it has also encouraged wrong headed analysis of the current state of affairs. There is a tendency to interpret conditions that are general in terms of individual actions. High rates of default are blamed on individual irresponsibility for example. With wide but shallow wisdom recommendations are easily made that students should change to programs that promise "employability." Colleges are charged with carelessness in producing overtrained persons in overcrowded occupations. Another line of argument is that college experiences don't make that much difference after all. Recommendations to overhaul the curriculum in favor of "high demand" programs come into the press with predictable regularity.

If we turn back to that basic assumption of immediate entry into a chosen field and adjust it to a new set of realities, then quite a different set of questions and answers emerges. The reality of the present situation is that there are almost no new jobs and just about none at the entry levels. For college graduates we do not actually know how bad conditions may be because they are disguised by underemployment, further schooling, and short term personal options. But let us accept

this as an approximation of reality and change the assumption to: All graduates are likely to face a delay in finding any employment and are unlikely to find a job in the area of their primary interests. Now the questions become broader: What is the profile of available job opportunities? What search strategies can be used to discover which jobs are in any way related to all my abilities career, personal, and vocational? How does one formulate a sound decision in the face of a completely new situation. For educational programs this new assumption raises an interesting dilemma: Is it wise to modify programs into career lines or to add entry level skills? Or should the emphasis be on skills and strategies of search and development? At the moment and for most of the next decade the process of entry into the labor force is likely to be as significant as the process of vocational choice. Education must make the first attempts at analysis.

Conceptual Framework

Changing the basic assumption to give emphasis to the entry process does not impair the outcomes of existing research but simply adds a whole new set of questions. As organizing principles for this inquiry two sets of ideas have been selected from the established body of concepts. It would be too much to designate them as coherent theories but each has supported a number of theoretical excursions. The first source is decision-making as that process has been adapted to career development. Economic decision theory treats the interplay of three factors: rewards or values, costs, and the probability of attaining a given outcome. One line of application to vocational choice deals with behaviors aimed at improving the probability of selected outcomes, at reducing uncertainty. In the career literature the process is one of narrowing alternatives, then strengthening the probability of those which remain (Hershenson, Roth 1966). However, in the case at hand the students, now graduates, are required to expand and assess their range of alternatives. Then are expected to act on the prospects that are developed. The components of the decision process include information, assessment factors, interaction with others and behaviors taken to improve probabilities. Questions in the survey instrument treat each of these areas.

The second source of concepts begins with the observation that development does not occur in a constant, steady stream but at irregular rates from event to event. These occurrences differ in importance and arrangement. Some events, called here decisive events, require careful analysis, then a choice. Others have a strong component of chance or circumstance which require the individual to recognize and accommodate to them. The complete pattern of events can be arranged into decision trees showing pathways of choice and consequence. This was done by Project Talent some years ago and by an educational development study at Penn State in 1970 (Lindsay 1970). In two recent studies of scientific development pathways made under NSF sponsorship, some attention was directed at cross relationships, Project Traces and Scientific Innovation (Battelle 1973). Longitudinal studies such as those in the Career threshold series sponsored by the Department of Laobr also develop this kind of perspective. These two ideas, components of decisions and decisive events, are encompassed in the variables treated by questions and items in a survey instrument.

1. The timing and therefore sequence of major events under seven general headings during the 12 months after graudation.

2. Most decisive events up to three in number could be identified in rank order. These were coded out in great detail and then classified under seven major groupings.

   In connection with each of these decisive events, the following sub-variables are identified: (a) the source of first information, (b) behaviors used to develop further information, (c) an evaluative description of the final choice, (d) an identification of persons with whom the deci-

TABLE I

DESCRIPTION OF SAMPLE AND PRELIMINARY RESPONSE: PENNSYLVANIA INSTITUTIONS 1973

Category of Institution	Total Baccalaureates A	Liberal Arts Grads B	Sample Share C	Response Rate D	%
I - Technical	336	116	13	6	(.46)
II - Applied	10,69[illegible]	1,110	431	210	(.49)
III - Comprehensive	9,942	1,454	337	117	(.35)
IV - Liberal Arts	6,046	2,815	135	72	(.53)
TOTAL	[illegible],020	5,495	916	405	

Note: An additional 220 have been added to category IV sample.

sion was discussed, (e) an assessment of what the respondent contributed by way of benefits to the situation.

3. Behaviors taken before graduation were assessed from two viewpoints--those that were taken and those which, in retrospect, the subject believed should have taken.

4. Conditions recommended as helpful, desirable, or necessary for upcoming graduates were identified.

5. Respondents were asked to compare their abilities in a variety of fields with their impressions of all college students.

6. Behaviors adopted to improve options were identified.

7. The components of ideal job were identified using a scale that had been developed in a study of professionals on the job.

Methodology

Sample: Subjects for the study weredrawn from a population of liberal arts majors, including those in the sciences, who received their degrees from Pennsylvania institutions in 1973. Among the 56,379 who received baccalaureate degrees in Pennsylvania that year, 27,020 were at sample institutions, 5,495 in liberal arts. There are two major problems in developing a sample within the population of liberal arts degree recipients. First, the degrees, BA or AB, are granted by several different kinds of institutions each representing a distinctive educational environment. Large universities with a range of professional degree options differ markedly from the traditional small liberal arts college. Former teachers colleges in transition represent another set. After looking at the Carnegie Commission typology and modifications to it, the decision was made to stratify institutions on the basis of the proportion of liberal arts degrees in the total group of baccalaureates from that institution. The distribution is shown in Table 1 as follows: Technical (7) $\leq .25$, Applied (29) = .26 to .49, Comprehensive (24) = .50 to .74, Liberal Arts (31) $\geq .75$. Numbers in parentheses show the total in each category. The proportion of graduates in each of the groups was calculated and then translated into a share of the intended sample.

The second problem, although somewhat mechanical, was critical for the project. Not only is no single address list available for the universe of liberal arts graduates but institutions vary widely in the accuracy and availability of such information about their own alumni. Using the stratified categories a number of institutions were asked to provide address lists. Individual cases for the sample were selected by drawing every "n^{th}" name from the lists. This procedure made it possible to improve the response by adding to the mailing list if there were instances of low accuracy on the address lists. Some of the responses, slightly more than a hundred, are not yet included in this data file.

Collection: An initial mailing of the questionnaire together with an explanatory letter and postpaid return envelope was followed by two subsequent mailings. The second was a postcard, the final mailing included a letter with a second copy of the survey instrument. Most of the mailings were made in the period from October to December 1974. They were intentionally scheduled to correspond with the Thanksgiving Day Holiday to cover the possibility of students who were away at school. The use of such mixed mailing list is filled with hazards and many of the problems materialized. The perishability of address lists, the essence of forwarding addresses, the preoccupation of subjects with their own travels or graduate study; all were encoun-

tered. Such difficulties were anticipated and debated quite early in the project but it was decided that direct expressions by graduates would have more validity than any indirect measure that could be constructed. Because the sequence and inter-relationship of events in the lives of individuals were of the main points in the study, the risk appeared to be warranted.

Analysis: In this report the data are presented in very simplified form. The tables are drawn from the first frequency tabulation and elementary analysis of them. Once the factors of significance have been established, cross tabulations will be made by majors, by types of institutions, and by delay/not delayed. In the final stage of analysis, factors related to early employment and other choices will be analyzed in detail.

The survey instrument developed for the study is both preliminary and extensive. The results of analysis will make it possible to prepare an abbreviated document for use in exploring reaction of other groups of graduates beyond liberal arts. For example, the next logical participation should come from the graduates in education. Not only has the job market changed radically in this field, but traditionally students prepared in these programs have moved readily into many other sectors of the labor market. Finally, this preliminary study should make clear whether examination of the twelve months after graduation is sufficient to capture most dimensions of the delayed entry problem.

Findings

To present the data as briefly as possible only a few summary statements will be made on each topic. Tables are included and can be examined by the reader in more detail.

1. The timing and nature of events in the year after graduation--
   Table 2.

   Respondents located eight kinds of occurrences along a time line. The main purpose was to analyze sequences, not yet completed, but the frequency data have some value. Military service, voluntary service, and full-time homemaking are infrequent occurrences. Further education shows a well structured pattern concentrated at the beginning of the year and apparently not often the result of default decisions. The job pattern over time is much looser, extending over six months, and accompanied by a significant number of layoffs.

2. The decisive life events: Table 3

   This was an open-end answer in which the response was coded into seventy categories then collapsed to the headings shown. This reflects a judgment of importance. Education and related events holds large importance with 38.4 per cent classing it among the primary happenings. Since the categories include preparing for further study it appears that respondents hold a strong belief in education as a general value. Landing a job and events related to it are most often identified as most decisive, 45 per cent. Personal events include marriage, both trial and formal, births, divorce, etc., and circumstantial includes illness or unidentified troubles.

3. Important components in decisions of life events: Tables 4-8

   Each of these tables was developed in the same manner, explained below, and it presents an assessment of the importance of each item as it applied

to a particular kind of decisive event. Four types of events requiring decisions were established by combining more detailed categories: Education which includes all such activity and decisions related to it, Full-Time Employment, Employment Related which includes part-time work, job changes, searching, and Voluntary Activity which includes travel, relocation, vacation, etc.

The distinction between "most decisive," "second" and "third" was eliminated by combining all responses into one score. The score was derived by assigning a value of four to "very important" or "very significant" and a value of one to "not applicable". By summing the individual scores on each item and dividing by the number of responses a mean assessment of importance was generated with a possible high score of four and a lower limit of one. The range of values in the data reported here is from 1.00 to 3.41. There are 365 cases in this run but many respondents were involved in more than one decision, so it may be helpful to have some idea of the number of item responses in each of the decision categories covered in Tables 4, 5, 7, and 8. Table 6 is not included. There is an average of 225 responses on Education decisions, 225 for Full-Time Employment, 115 on Employment Related, and 100 for Voluntary events.

The information component of decisions, that is, where the first information came from and how it was developed, is treated in Tables 4 and 5. If we keep in mind that the kinds of decisions involved here are quite different, graduate study being of a different nature than employment or voluntary activity, then there is a notable lack of differentiation in both sources used and actions to follow up. The circle of sources is narrow, personal in nature, and this feature persists in the pattern of interaction reflected in Table 7 too. The variation appears in education where college faculty or staff are rated as having some importance in the decision. The strength of the judgments about education is also greater here and throughout the data. Clearly, this is a familiar area in which the respondents know where to go for information, feel the opinions of an objective kind can be sought, and bring a sense of values with which to judge importance of the contributions.

What the respondents think they brought to the decision situation is reflected in Table 8. They do not see specialized knowledge as particularly important at this point in their careers although the data in Table 11 shows a good degree of confidence in that attribute. It is the interpersonal relations area in which they feel ready to contribute along with a measure of enthusiasm. There is no illusion that the degree carries its own value.

Table 9 represents an attempt to capture a retrospective view about pregraduation actions. It's clear that the conventional recommendations of the day were followed: tests taken, resumes prepared, files put in order, and letters written. It is interesting and important that the recommendations that are strongest deal mostly with getting better information about the climate in which those letters and tests will be received. The importance of faculty contact in the senior year is emphasized but few colleges have made provision in the schedule to accommodate it.

Table 10 confirms some of these indications about the need for more useful information on jobs. The desirability of more information on the quality of graduate programs takes on special significance because quite a few of the participants have had a full year of graduate study. Worth noting, too, is the relatively low rating given to preparation in a "marketable skill", one of the favorite remedies for improving employability these days.

The judgment of how competent one is and in what areas is related to decisions indirectly through the support it gives to action. In Table 11 the statements are grouped into general abilities, specific competencies, and some general non-cognitive attributes. We note first that those items that cannot be easily tested or specifically demonstrated are rated high; ability to analyze critically, working with people, learning quickly. In the case of specific skills there is a good deal of realism and honesty. In the general areas where a liberal arts program is at its best the respondents feel on sound ground about their abilities.

Table 12 is a straightforward summary of behaviors taken to improve options connected with the various kinds of decisions. Again we see the heavy dependence on personal impressions and actions rather than any objective or interactive behavior. Whatever techniques of research or investigation the academic world provided seem to have been left in that setting. Tables 13 and 14 are self-explanatory and comment is omitted in the interest of brevity.

Some Tentative Conclusions

The orientation of educational practice toward the problem of entry into the labor market emphasizes the selection of, and preparation for, career options that are as specific as possible. Under this view adjustments to a tight or erratic labor market must be made by shifting programs to high demand fields and encouraging students to alter choices toward job areas that are more in demand. This mode of adjustment assumes great flexibility in program design at the college level, a condition that does not exist and is not likely to come about. It also assumes that students are capable of large personality adjustments in matters of cognitive style, values, and attitudes.

An alternative lies in depending on more flexibility in the search process. Under this view graduates, as individuals, would search across the available job market until they encountered an opportunity for which they were ready to trade off its undesirable aspects for the good features. Such an alternative depends heavily on developing a large body of information and assessing it with as much help as possible. In turn, this requires a well-developed sense of strategy and the search skills to make it effective. Also necessary is enough confidence to maintain a good activity level.

The data collected here reflects, in general, a poorly developed sense of search strategy. The range of sources for information is narrow and highly personalized. There is little disposition to transfer the research techniques of college to a new setting or to use college resources as an aid except in education. Self-based activity predominates; letter writing, self-study, personal inquiry are the principal modes of action. There is an awareness that information is faulty and incomplete along with a hint that someone else should provide it. Self-assessment is high but with certain elements of unreality.

The implications can be summarized in terms useful to those who plan college programs, particularly in the liberal arts. During the senior year students can be presented with a range of search strategies that emphasize how to develop new information and contacts and how to translate that information into a program of action. Their areas of competence should be identified and reinforced. Prototype and lead-in experiences, such as test taking, application forms, and resumes, can be specified and emphasized. Under such an approach there is no requirement that the traditional values of liberal education and self development be set aside. Supplemented by a coherent set of strategies and skills, it becomes the basis of further career development.

TABLE 2

TIMING OF EVENTS JULY 1973 THROUGH MAY 1974

Nature of Event	1973 Jul	Aug	Sept	Oct	Nov	Dec	1974 Jan	Feb	Mar	Apr	May	Σ
Graduation	6	13	0	0	4	6	0	0	1	0	0	30
Summer, Part-Time Job	131	15	6	10	5	0	5	8	3	5	27	215
Full-Time Job	77	17	47	26	20	13	16	11	9	11	24	271
Graduate or Professional School	14	25	84	5	0	3	14	1	3	1	9	159
Voluntary Service	1	0	1	1	0	0	0	0	1	1	2	7
Military Service	3	1	0	1	1	0	1	0	1	1	1	10
Home-Making	7	8	3	6	1	2	3	0	2	3	9	44
Involuntary Un-employment	9	5	11	7	3	9	4	3	3	6	6	66
Voluntary Personnel Activities	35	15	12	2	2	10	6	6	4	4	26	122
Missing Data	82	266	201	307	32[illegible]	322	316	366	338	333	261	
TOTAL	283	99	164	58	36	43	49	29	27	32	104	924

N = 365

TABLE 3

DECISIVE LIFE EVENTS: BY IMPORTANCE

Category Label	Most Decisive Event	(Percent)	Second Decisive Event	(Percent)	Third Decisive Event	(Percent)	Σ
Personal Event	33	(9.1)	10	(3.6)	13	(7.1)	56
Formal Education	108	(29.8)	40	(14.4)	14	(7.6)	162
Education Related	31	(8.6)	27	(9.7)	19	(10.3)	77
Full-Time Employment	137	(37.8)	76	(27.4)	35	(19.0)	248
Employment Related	26	(7.2)	64	(23.1)	49	(26.6)	139
Voluntary Events	23	(7.4)	52	(18.8)	41	(22.3)	116
Circumstantial Event.	4	(1.1)	8	(2.9)	10	(5.4)	22
Subtotal	362	100%	277	100%	184	100%	
No Response	3		88		181		275
TOTAL	365		365		365		1095

TABLE 4

SOURCES AND IMPORTANCE OF FIRST INFORMATION ON DECISIVE EVENTS: MEAN SCORES

	Education Related	Full-Time Employment	Employment Related	Voluntary Activity
Chance encounter	1.62	1.95	1.71	1.79
Personal inquiry	3.41	3.15	2.95	2.89
Close friends	2.25	2.32	2.09	2.66
Fellow workers/classmates	2.17	1.70	1.78	1.80
Family or parents' friends	2.04	2.08	1.94	2.22
College faculty/staff	2.21	1.49	1.37	1.32
College placement office	1.43	1.33	1.13	1.00
Business or government notices	1.21	1.48	1.43	1.07
Public advertisement	1.40	1.72	1.63	1.54
Other	1.76	1.94	1.83	1.85

Question Format

3. What were the *sources of first information* on the decision? *How important* was each?

	Most Decisive Event				Second Decisive Event				Third Decisive Event			
	(4) Very important	(3) Important	(2) Of Some importance	(1) Not Applicable	4 Very important	3 Important	2 Of Some importance	1 Not Applicable	4 Very important	3 Important	2 Of Some importance	1 Not Applicable
a. chance encounter or hearsay	□	□	□	○	□	□	□	○	□	□	□	○
b. personal inquiry	□	□	□	○	□	□	□	○	□	□	□	○
c. close friends	□	□	□	○	□	□	□	○	□	□	□	○
d. fellow workers or classmates	□	□	□	○	□	□	□	○	□	□	□	○
e. family members or parents' friends	□	□	□	○	□	□	□	○	□	□	□	○
f. college faculty or staff members	□	□	□	○	□	□	□	○	□	□	□	○
g. college placement or counseling office	□	□	□	○	□	□	□	○	□	□	□	○
h. business or government notices	□	□	□	○	□	□	□	○	□	□	□	○
i. advertised public information	□	□	□	○	□	□	□	○	□	□	□	○
j. other (specify)	□	□	□	○	□	□	□	○	□	□	□	○

TABLE 5

ACTIONS TO DEVELOP ADDITIONAL INFORMATION: IMPORTANCE: MEAN SCORES

	Education	Full-Time Employment	Employment Related	Voluntary
Personal conversation with sponsor/employer	2.51	3.31	3.03	1.99
Corresponded or telephoned employer	2.61	2.67	2.31	1.79
Invited for interview	2.01	3.11	2.41	1.45
Visit or observation trip	2.73	2.69	2.32	2.30
Inquired of friends/ associates	2.33	1.88	2.01	2.76
Inquired of family members	1.83	1.75	1.72	2.34
Contacted faculty members	3.39	1.31	1.28	1.43
Contacted college counseling/ placement office	1.52	1.26	1.09	1.05
Researched library or other published data	1.99	2.15	1.27	1.55
Other	1.60	1.21	2.13	1.72

Question Format

4. By what means did you develop *additional information* and *how important* was it?

	Most Decisive Event				Second Decisive Event				Third Decisive Event			
	Very Significant	Significant	Of Some Significance	Not Applicable	Very Significant	Significant	Of Some Significance	Not Applicable	Very Significant	Significant	Of Some Significance	Not Applicable
a. initiated personal conversation with sponsor or employer	□	□	□	○	□	□	□	○	□	□	□	○
b. correspondence or telephone inquiries to sponsor or employer.	□	□	□	○	□	□	□	○	□	□	□	○
c. invited for interview	□	□	□	○	□	□	□	○	□	□	□	○
d. made a visit or observation trip.	□	□	□	○	□	□	□	○	□	□	□	○
e. inquired of friends and associates	□	□	□	○	□	□	□	○	□	□	□	○
f. inquired of family members	□	□	□	○	□	□	□	○	□	□	□	○
g. contacted faculty members	□	□	□	○	□	□	□	○	□	□	□	○
h. contacted college counseling or placement office	□	□	□	○	□	□	□	○	□	□	□	○
i. researched library or other published data	□	□	□	○	□	□	□	○	□	□	□	○
j. other (specify)												

TABLE 7

INTERACTIONS ASSOCIATED WITH DECISIONS: IMPORTANCE: MEAN SCORES

	Education	Full-Time Employment	Employment Related	Voluntary
Self-made choice	2.68	2.74	2.78	2.86
Fiance/fiancee	1.99	1.73	1.47	1.66
Close friends	2.15	1.88	1.86	2.56
Classmates/fellow workers	1.95	1.84	1.58	1.88
Brothers and sisters	1.66	1.52	1.51	1.77
Parents	2.31	2.26	2.92	2.22
Other relatives/family friends	1.49	1.40	1.42	1.57
College prof./former teachers	2.27	1.30	1.30	1.39
Supervisors/employers	1.41	1.67	1.48	1.33
College offices, placement, counselling	1.58	1.12	1.08	1.08
Private agencies: employment or counseling	1.06	1.15	1.05	1.07
Public agency: employment or counseling	1.07	1.10	1.04	1.07
Other	1.81	1.46	1.87	1.52

TABLE 8

RESPONDENT'S ASSESSMENT OF CONTRIBUTIONS TO SITUATION: IMPORTANCE: MEAN SCORES

	Education	Full-Time Employment	Employment Related	Voluntary
Trained/special knowledge and skill	2.60	2.66	2.43	2.01
Skills/knowldege from a vocation/hobby	2.00	1.95	1.97	2.04
Certified education:	2.91	2.72	2.55	1.52
Ability to work with people	2.57	3.25	3.14	2.25
General intellectual and analytical ability	3.35	3.06	2.74	2.28
Special contacts with people	1.95	2.14	2.02	2.10
Enthusiasm and energy	3.01	3.24	2.90	2.79
Creative/fresh viewpoint	2.56	2.65	2.43	2.41
Other	1.50	1.21	1.42	1.38

6. *With whom* did you review the factors in this decision? *How important* was the contribution?

QUESTION FORMAT

	Very Important	Important	Of Some Importance	Not Applicable	Very Important	Important	Of Some Importance	Not Applicable	Very Important	Important	Of Some Importance	Not Applicable
a. no one else, a self-made choice	□	□	□	○	□	□	□	○	□	□	□	○
b. fiance/fiancee	□	□	□	○	□	□	□	○	□	□	□	○
c. close friends	□	□	□	○	□	□	□	○	□	□	□	○
d. classmates or fellow workers	□	□	□	○	□	□	□	○	□	□	□	○
e. brothers & sisters	□	□	□	○	□	□	□	○	□	□	□	○
f. parents	□	□	□	○	□	□	□	○	□	□	□	○
g. other relatives and family friends	□	□	□	○	□	□	□	○	□	□	□	○
h. college professors or former teachers	□	□	□	○	□	□	□	○	□	□	□	○
i. supervisors or employers	□	□	□	○	□	□	□	○	□	□	□	○
j. college offices, placement, counselling	□	□	□	○	□	□	□	○	□	□	□	○
k. private agencies: employment or counseling	□	□	□	○	□	□	□	○	□	□	□	○
l. public agency: employment or counseling	□	□	□	○	□	□	□	○	□	□	□	○
m. other (specify)												

7. What do you feel you brought to the situation? How important was this contribution?

Question Format

	Most Decisive Event: 4 Very Important	3 Important	2 Of Some Importance	1 Not Applicable	Second Decisive Event: Very Important	Important	Of Some Importance	Not Applicable	Third Decisive Event: Very Important	Important	Of Some Importance	Not Applicable
a. trained or special knowledge and skill	□	□	□	○	□	□	□	○	□	□	□	○
b. skills or knowledge from a vocation or hobby	□	□	□	○	□	□	□	○	□	□	□	○
c. certified education: a degree	□	□	□	○	□	□	□	○	□	□	□	○
d. ability to work with people	□	□	□	○	□	□	□	○	□	□	□	○
e. general intellectual and analytical ability	□	□	□	○	□	□	□	○	□	□	□	○
f. special contacts with people	□	□	□	○	□	□	□	○	□	□	□	○
g. enthusiasm and energy	□	□	□	○	□	□	□	○	□	□	□	○
h. a creative or fresh viewpoint	□	□	□	○	□	□	□	○	□	□	□	○
i. others (specify)												

TABLE 9

ACTIONS TO AID DECISIONS: THOSE TAKEN & RECOMMENDED

	Actions Taken	Should Have Taken
a. Took national tests used by graduate and professional schools. Which ones? *+	210	51
b. Took municipal, state or federal civil service examinations	89	61
c. Registered with college placement office	166	45
d. Prepared a placement file with letters of recommendation, transcripts, grades, etc.	166	47
e. Wrote letters to graduate or professional schools. To how many? #	207	33
f. Inquired of family and friends about employment possibilities	174	20
g. Developed career plans with faculty members	95	62
h. Wrote letters to companies about employment	101	44
i. Prepared a personal resume of education and experience	206	40
j. Took courses that dealt with career placement or graduate study	83	49
k. Participated in "career day" conference to meet prospective employers	33	57

Notes:

*Taken GRE 97, LSAT 42, D&MCAT 33, MAT, AT65B 22

+Should Have GRE, LSAT

#Mean 8.15, md. 5.74

TABLE 10

PRECONDITIONS JUDGED HELPFUL

	Most (4) Necessary	Very (3) Helpful	Somewhat (2) Desirable	Not (1) Applicable	$\bar{x}$ Score
a. More information about myself--test results, counselors' assessments.	55	104	147	42	2.49
b. Better information on salary levels, fringe benefits and other general work conditions.	65	107	116	63	2.47
c. Accurate information about the job prospects in my field.	217	94	23	18	3.45
d. Wider information about alternate job areas.	175	116	34	18	3.31
e. Better information on graduate or professional study; particularly:					
costs	82	111	96	52	2.65
admissions policies	101	121	69	43	2.83
knowledge expectation	102	125	57	47	2.85
quality of programs	139	110	43	35	3.08
f. Information on alternatives to jobs and further study such as travel, volunteer service.	80	110	107	49	2.64
g. Training in one marketable skill such as accounting, computer programming, lab techniques, surveying or blueprint reading, psychological test administration, etc.	78	108	96	68	2.56
h. A chance to develop an avocation or hobby to the point of saleability--photography, graphic arts, athletic skills.	57	119	114	61	2.49

TABLE 11

SELF-ASSESSED COMPETENCE RELATIVE TO OTHER GRADUATES

	Exceptionally High (5)	Above Average (4)	About Average (3)	Below Average(2)	Near the Bottom(1)	$\bar{x}$ Score
a. Amount of general knowledge in literature, history, art.	43	156	118	38	3	3.55
b. Amount of general knowledge in science and math.	57	119	123	50	8	3.47
c. Amount of specialized knowledge in one or two fields.	122	161	56	15	2	4.10
d. Ability to write effectively	95	146	84	30	2	3.85
e. Ability to speak effectively	67	146	116	26	3	3.69
f. Ability to analyze critically	97	180	70	9	2	4.00
g. Skill or technique in laboratory	39	66	111	96	43	2.89
h. Computer or statistical skills	12	70	88	95	91	2.49
i. Skill in foreign language	34	68	112	76	66	2.80
j. Athletic skill	26	91	154	60	24	3.10
k. Artistic skill: music (Drama or dance)	23	81	81	103	67	2.70
l. Artistic skill: painting, photography	24	71	93	105	60	2.70
m. Supervisory or management skill	39	151	132	28	5	3.54
n. Skill in working with people	106	169	70	5	2	4.06
o. Technical skill (specify)	45	51	42	25	33	3.25
p. Ability to learn new material quickly	114	184	53	3	1	4.15

TABLE 12
ACTIVITIES UNDERTAKEN TO IMPROVE OPTIONS

	Very Worthwhile	Worthwhile	Of No Worth	Not Applicable
a. Increased skills or developed new skills:				
by self-study and practice on my own	133	122	12	76
by enrollment in formal courses at college or community college level	77	56	16	187
by specialized courses at a proprietary institution	30	23	11	260
by tutored study	7	15	12	294
by interim employment that cultivated skills	78	90	16	153
b. Analyzed abilities and needs:				
by comprehensive self-analysis	151	135	10	65
by reviewing previous data from college counseling	9	55	62	202
by consulting with a responsible individual who had no specialized training	23	94	35	176
by association with professional counseling agency or individual	20	57	39	212
c. Gathered information on the employment market by:				
looking around on my own at what was happening	116	148	19	59
researching books and periodicals	38	122	40	154
talking with friends and associates	80	180	28	51
talking with knowledgeable persons in business and government	60	108	26	140
keeping in touch with the college placement office or dean's offices	11	41	76	202
directing letters or calls of inquiry to business and offices	52	92	36	149
d. Gathered information on graduate study by:				
personal impressions	77	144	21	92
examining catalogues and announcements	103	141	15	85
talking with enrolled students	74	109	20	135
visiting campuses and speaking with representatives	66	70	22	176
sending letters of inquiry to various associates and professionals	43	82	22	189
contacting undergraduate teachers	40	94	27	174

TABLE 13

REQUIREMENTS OF IDEAL JOB

	High	Medium	Low	Mean Rank (n)
1. Provide an opportunity to use by special abilities or aptitudes	292	59	3	*2.2 (210)
2. Provide me with a chance to earn a good deal of money	89	187	78	1.9 (61)
3. Permit me to be creative and original	249	92	12	*2.0 (154)
4. Give me social status and prestige	57	167	130	1.7 (19)
5. Give me an opportunity to work with people rather than things	200	114	40	*2.1 (120)
6. Enable me to look forward to a stable, secure future	162	155	38	*2.0 (101)
7. Leave me relatively free of supervision by others	158	155	41	1.8 (63)
8. Give me a chance to exercise leadership	133	170	52	1.9 (45)
9. Provide me with adventure	115	164	75	1.8 (34)
10. Give me an opportunity to be helpful to others	215	112	27	*2.0 (139)
11. Provide the geographic location I desire	122	149	82	1.7 (46)

TABLE 14

CAUSES OF INTERRUPTIONS/DELAY

Category Label	Absolute Frequency	Adjusted Frequency (Percent)
Military Service	5	11.6
Financial, Employment	6	14.0
Illness, Medical, Family	10	23.3
Opportunity, Travel	3	7.0
Academic Difficulty	12	27.9
Marriage	1	2.3
No Delay	322	Missing
Missing Data No Response	6	14.0
TOTAL	365	100.0

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HIGHER EDUCATION PROGRAM PLANNING AND MANPOWER RESEARCH: YES OR NO ?

Robert D. Newton*

The mere suggestion that manpower research is deserving of a place within the scheme of educational planning frequently invokes controversy. Usually opposition is based upon two grounds. The first condemns the propriety of its application in a democratic society on the hypothesis that use of forecasts of manpower supply and demand will lead ultimately to a situation where the individual is no longer able to exercise his free choice in selection of a career. But this concern apparently stems from a failure to recognize a distinct difference between the way in which manpower forecasts are employed in this country and many other parts of the world. As succinctly observed by Ahamed and Blaug:

> "American and Canadian forecasts are designed to improve labor placement and government training programs and stop short of translating the occupational distribution into a projected educational distribution."(1)

The second of the two frequently voiced criticisms concerns the accuracy of manpower forecasts. Obviously, no projection is perfect. The only thing that is certain about the future is its inherent uncertainty. Although we cannot expect any forecast to eliminate all possibility of error, we can expect to reduce the margin of uncertainty and the use of replicative statistical procedures have been shown by Armstrong and Grohman to produce superior results to those falling within the judgmental categorization (2). There is room for improvement in the accuracy of manpower projections, but this will come with time as further research is conducted. But even some of the older endeavors exhibit a surprising degree of accuracy. For example, using data from the 1960 census, Goldstein found that the projections published in the 1949 edition of the Occupational Outlook Handbook, were correct from both a directional and magnitude standpoint in about three-quarters of the individual cases (4).

Application of manpower research methodology to the educational scene in the United States has essentially attempted to counter the recognized propensity of the prospective student to base a life-long career decision upon a myopic and frequently incomplete perception of the currently applicable benefits of a chosen vocation. Toward this objective the following three processes have been employed:

1. Forecasting occupational demands out into the time horizon.

2. Identifying those occupations for which the projected supply by continued application of the current educational system is likely to be inadequate.

3. Providing stimuli usually in the form of economic incentives to students or institutions to augment the supply in those occupational sectors likely to be deficient.

These three processes were uniquely suitable for application in an expansionary economy where the goals simply were to widen the scope of opportunities for students and at the same time to offset prospective deficiencies in the occupational composition of the labor force. Rejection of the advice offered by the information gener-

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ated by these processes, however, carried no penalty because there existed an underlying minimal demand for trained persons of all types, an environment which assured everyone of an occupational opportunity and justified any educational program in its direct or indirect support.

But unfortunately, times are beginning to shift to a less hospitable environment for emerging graduates of our educational institutions. The minimum underlying support is eroding and the phenomenon is likely to become more pronounced over the next 10 years. Rather candidly, the environment has been characterized by the U.S. Bureau of Labor Statistics as follows:

> "Two significant departures from past trends are supplied by projections of the U.S. economy to 1985: (1) a sharp slowdown in overall economic growth and (2) a potential oversupply of college graduates, both to begin in the late 1970's." (6)

These and other assessments indicate rather clearly that if the currently troubled U.S. economy manages to revert to normalcy--with inflation controlled and a severe recession avoided--then the economic situation is not likely to be as pleasant as it was in the last two decades (5). Specifically, in regard to college graduates we will move from an era when demand outstripped supply to one in the latter half of the seventies when supply and demand may be roughly in balance in the aggregate but with imbalances in specific occupations. In the eighties, the supply will grow faster than demand and although this may not mean large-scale unemployment among college-trained personnel, it most certainly will result in underemployment--availability of jobs with skill demands less than capabilities--and a rise in the specificity of job requirements and credentialism.

What is salient about this prospective environmental change is that, although our efforts in the immediate past were directed toward attempting to optimize the distribution of a seemingly constrained supply of trained manpower among a numerically greater demand, our focus in the next decade must be on attempting to highlight what may be limited opportunities and to discourage endeavors into areas of significantly oversupplied prospects. To do so, the quality of manpower forecasts must continue to be improved, systems of communication must be built to transmit this information to those individuals in the career-selection process and the educational community must become more responsive toward meeting the shifts involved.

Of premier importance in this hierarchy of objectives is the constituency represented by students or prospective students in higher education. Principally it is this group which manpower forecasts should attempt to serve. To gain some insight in the manner in which this service may be rendered, we can turn to some of the results from a survey made in the late sixties among students in institutions of higher education by Freeman in connection with his rather exhaustive investigation concerning the economics of career choice (3). Limiting the review to those items especially pertinent to our concern, Freeman's survey revealed the following:

1. With respect to the timing of career choice, the overwhelming majority of respondents regarded the period of college attendance as the one most appropriate for resolution of career decisions.

2. A majority expected to work permanently in occupations highly related to their major fields of study and, as a consequence, the selection of curricula and occupations were closely allied decisions.

3. Their framework of knowledge for career choice consisted of a fairly accurate appraisal of the currently applicable economic benefits associated with various occupations and to a lesser degree those aspects of a noneconomic nature.

4. Other than informational sources closely related to students' backgrounds, association with teachers, public media, and sometimes summer employment were viewed as important channels of information on which to base career decisions. Of perhaps significance was the report that guidance counseling functions were of little utility.

5. About one-half of the respondents indicated that they were amenable to further changes in their choices of career if further information were made available to them.

In brief, what do these results tell us about the career-choice process? First of all, the interval of college attendance is a formative one for students, when in light of information available to them, they weigh career alternatives and select appropriate curricula. Their decision bases, however, are rooted in the present rather than in life-times and the channels of information are principally circumscribed by their academic life and public media. Adequacy is at best questionable in view of the high proportion reported to be amenable to further change and seeking additional information.

Against a picture of somewhat tarnished occupational prospects over the next decade, it is safe to assume that information needs on career choice will be more acute. No longer will it be possible to simply presume availability of post-graduation employment regardless of the field of study, a perception applicable over the last two decades. Increased emphasis must be placed not only upon job opportunities in the post-graduation period, but also in the likely impacts of longer-term trends. To meet such a need, what characteristics should an appropriate information system possess?

1. First, prospects on a geographically subdivided basis for various occupations in terms of number of new openings should be projected for the period of time immediately following completion of a student's schooling. Forecasts of this type would respond to student concerns of employment following graduation. From a feasibility standpoint, short-term forecasts of both employment and new openings are now a reality.

2. But short-term forecasts are not enough. Additionally, the student needs some assurance of his continued employment throughout his career-life, both his chosen occupation and those peripheral from an educational viewpoint to his major field of study, should he, by his volition or otherwise, move out of his initial choice of career. From information of this type, the prospective career choice may be assessed in relation to long-term opportunities. Appraisals of this type provide a new challenge to manpower researchers. First, they will require determinations of how families of occupations relate to specific curricula and which ones parallel each other to an extent sufficient to ease vocational transferrability. Secondly, long-term forecasts of this type will generate a need for new modes of presentation such as the expression of results in terms of probabilities or conditioned upon alternative economic or technological assumptions.

3. The mere generation of information itself may prove to be inadequate unless we can devise effective processes to assure its unbiased availability to those individuals in the career-selection mode of their lives. Accomplishment will not necessarily be secured through the simplistic process of document publication alone. Encouraging toward realization of this goal is the support of the U.S. Department of Labor through the occupational Information Systems Grant Program in the design of prototype

systems for the delivery of manpower data and, hopefully, their evaluation of various approaches will focus on their relative effectiveness in achieving this objective.

4. Lastly, with the unhappy prospectus of reduced employment opportunities over the next decade, an intensified need will emerge for the individual to be able to contend efficiently and effectively with the vagaries of the job market. Educational institutions should lead in this effort. Consideration should be given to incorporation within their curricula of courses addressing the mechanics of job seeking. Of longer-term benefit, the educational function should strive toward the development of a substantive framework of information that can be continued use to individuals throughout their career lives (7).

So far this discourse has been concerned solely with the potential importance of manpower information to the individual. As such it has skirted the issue of how such information may be employed in educational program planning. Personally, I view as unrealistic the eventual emergence of any type of one for one equivalency between a forecast of occupational demand and an appropriate educational supply. Furthermore, our experience in selective stimulation of various of educational activities through governmental and foundation support over the last couple of decades has not been reassuring of the wisdom of intervening judgments on the normal forces of the marketplace. On the other hand, I view as likely that, given some reasonably accurate prospectives of future occupational needs, students will engage in a selective process which will provide a better balance--and at the very least will minimize the extremes of imbalance--between manpower supply and demand than we are likely to have with the continuance of an informational vacuum in this area.

These informed choices may in the aggregate form the basis for a potential impact of manpower forecasts into the educational planning process uniquely suited to the conditions of the next decade. With the nation's colleges and universities facing the likelihood of declining enrollments over the next decade or two, the educational community will be plagued with prospect of contraction. I suggest that perhaps the best way to accomplish this process is by permitting a competitive system to function and placing upon the institutions themselves the responsibility for reacting to student needs derived from informed career choices. Those institutions which alertly react in program planning to the same informational bases provided to student populations for career decisions will prosper and continue to benefit society. Those which do not successfully adapt to such an environment will ultimately comprise the contraction gap.

In closing let us turn to the query posed by the title of this presentation: "Higher Education Program Planning and Manpower Research: Yes or No." In the broad sense, the response should be in the affirmative. But the direction of the research should be focused on providing the prospective student populations the bases for informed decisions on career choices, particularly in view of the employment prospectus of the decade ahead. Given such a condition, the program planning of the educational community must react in a mode synchronized with the aggregative impact of these decisions.

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HIGHER EDUCATION PROGRAM PLANNING AND MANPOWER RESEARCH: YES OR NO?

Harold G. Richard*

It is beginning to appear that the underlying philosophy of educational planning in the Commonwealth of Pennsylvania is in the process of fundamental change. Until the recent past, education in the Commonwealth has been provided for on the basis of a "social demand approach" to educational planning. The fundamental tenet of this approach is that that Commonwealth should provide educational opportunities geared to the demand of the citizens for further education. Fundamental also to this philosophy is the concept that the educational consumer is the best judge of his own aspirations, talents, and opportunities for success. Over the last few years, various documents coming from Commonwealth governmental agencies and offices have given educators and thinking citizens of all walks of life cause for alarm. These documents, particularly the various "budgeting guidelines," have indicated that the Commonwealth is moving toward a philosophy of educational planning which can be characterized as the "manpower planning approach." Greatly simplifying, the fundamental tenet of this approach is that the Commonwealth will be reticent to fund any educational programs where manpower studies and/or forecasts do not indicate a greater demand for graduates than are projected to come from existing programs. In other words, the Commonwealth will seek to balance occupational supply and demand in the world of work through funding of appropriate programs in higher education. Over supply will be controlled through providing limited numbers of spaces in the institutions of higher education. Individuals aspiring to certain careers will have to vie with others for the available educational opportunities. If they cannot successfully compete for the available positions within the Commonwealth, they can (1) switch their vocational aspirations, (2) forego higher education, (3) seek program entry in another state or at a private institution.

There are strong counter indications to any inclination on the part of the Commonwealth to change its philosophy of educational planning from a "social demand approach" to a "manpower forecasting approach." Simultaneously one needs also to admit that there is a pressing need for various kinds of manpower studies which are needed as inputs into the decision-making process at various levels of educational planning. This paper will therefore deal with two topics. First, it will affirm the need for various kinds of manpower studies to be used in educational planning. Secondly, it will raise some cautions against a shift to a "manpower forecasting approach" as the basic philosophy of educational planning.

THE NEED FOR MANPOWER STUDIES

There is a pressing need for a variety of manpower studies. The use of the term "manpower studies" as opposed to "manpower forecasts" is intentional because we need manpower studies which go beyond mere forecasts. These manpower studies are needed to serve a variety of needs for educational planning at various levels of planning. Therefore, this paper does not seek to reduce the level of manpower studies but rather to plead the extension and furtherance of manpower studies.

A variety of manpower studies are needed for inputs into the decision-making processes in higher education. Not the least of these kinds of studies are those which can be characterized as manpower forecasts. Even this category can be sub-

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divided into forecasts of "demand" and forecasts of "need" if we recognize the difference between the two terms. By manpower forecasts we normally mean projections of the number of people of various occupational classifications that will be required to support some projection of the state of the nation's economy at some future point in time. This constitutes the traditional "demand" forecast. Of course, such forecasts can be arrived at through a variety of ways which will not be further explored in this paper. A "need" forecast would differ in that it would seek to project the manpower needed to meet some scenario of societal needs as opposed to a scenario of economic conditions (Lecht, 1969). Other studies are needed in addition to manpower forecasts. Our information is woefully inadequate in the area of what happens to people after they graduate or leave higher education. In short we need longitudinal studies of how people do or do not use their higher education in furtherance of vocational (and other) pursuits in their subsequent life. We need studies which indicate how some forms of labor can be substituted for other forms of labor and how capital can be substituted for labor. We need further studies on the nature of cyclical shortage and surplus of manpower in various areas as reflected in the so-called cob-web effect (Freeman, 1971). A variety of studies are needed on the technical obsolescence of manpower and how it can be overcome. I am sure that anyone can considerably extend this list if one looks at the variety of educational planning decisions that must be made and who must make these decisions.

This leads to a second point which must be made about the needed manpower studies. They must be directed toward specific audiences and great care must be taken that they not be misused by well-intentioned others. Such misuse can generally be avoided by the study being specific in delineation of its assumptions and limitations. In general, manpower studies are needed for well-informed decision-making by (1) potential students, (2) educational institutions, and (3) governmental budgeting, planning and coordinating agencies. Again, the order of these is intentional. This author believes that the nature of existing manpower studies and those contemplated, planned, or possibly in the near future can be used with decreasing efficacy by educational decision-makers in the order specified. In short, the studies should be directed toward first informing the decision-making of consumers, then of providers of services and then of governmental budgeting, planning and coordinating agencies. In short, this author believes that the overwhelming thrust of the literature supports the contention that existing manpower studies do not support the close coupling of educational budgeting, planning, and coordination with such studies. In the words of Folger, et al, (1970)

> Our ability to forecast the future is so poor and our knowledge of adjustment mechanisms so inadequate that any planned intervention is about as likely to have an unwanted outcome as a result that was intended (p. 258).

CAUTIONS ON MANPOWER-ORIENTED EDUCATIONAL PLANNING

Having already agreed that manpower studies are needed for informed educational decision-making by potential consumers, by educational institutions and by governmental budgeting, planning, and coordinating agencies, certain cautions are in order. Educational decision-makers should be cautious in using such information because of certain counter-indications to reliance on such information for educational decision-making. For instance:

1. Present proposals for educational funding, especially at the federal level, seem to lean toward proposals which would put more power into the hands of

the educational consumer. Educational consumerism is on the rise.

2. The use of manpower forecasts as a basis for educational planning is not justified by the present state-of-the-art.

3. The efficacious use of a manpower forecasting approach to educational planning presupposes a knowledge of the underlying bases of student aspirations, or the mechanisms of program selection, and of the relationship of these and other factors to subsequent employment histories. However, our knowledge in these areas is inadequate.

4. The ability of institutions and of subdivisions within institutions to continuously make an extensive series of adjustments is limited by a variety of factors. The ability of institutions to influence student career choice is limited.

The discussion that follows will deal with these cautions in some greater detail.

Educational Consumerism

Contrary to student cries of the late 1960s and early 1970s , the student consumer has always had a profound effect on the direction of higher education. When education's programs were relevant to the needs of students and society, education profited and prospered. When education ceased to be relevant, it withered and waned. Rudolph's "The American College and University" (1962) and many other histories of American higher education are replete with instances of institutional responsiveness (although usually delayed) to student and societal demands for relevance to the needs of the day.

Present proposals for educational funding, especially at the federal level seem to lean toward proposals which would put more power into the hands of the educational consumer. Proposals seem primarily to contemplate putting money into the hands of the student so that she/he can attend the institution of the individual's choice. Alternatively, the governmental grant would follow the student. It is obvious that, therefore, the institutions of higher education would be forced to vie for students in order to attract the educational dollars.

In addition, we are, at least for the near future, in a period of enrollment decline in higher education. In part this reflects decreasing numbers of citizens in the traditional college-going age groups but also it reflects decreasing propensities for going on to higher education. This condition of declining enrollments also indicated a "buyer's market" as far as students are concerned, and will further tend to make institutions of higher education more responsive to students.

The implications of educational consumerism for educational planning are obvious. Institutions of higher education had better offer programs which students want or they will have no students. If an institution does not offer the program which a student wants, she/he will take his money and go where she/he can get into the program that she/he wants. If the student believes that she/he can get the kind of job that she/he wants because of whatever special credentials she/he might possess, then she/he will choose that vocation in spite of any manpower forecasts which predict an oversupply of manpower in the particular field.

Manpower Forecasting Inadequacies

Dean G. Lester Anderson of The Pennsylvania State University's Center for the

Study of Higher Education once noted that, "In an open society 'we do not program people.' With the margins of error that exist in manpower estimates we dare not." (1970). Again, the criticisms of manpower forecasting has concentrated on the manpower forecasts themselves or on problems associated with their close coupling with educational planning. Criticism has concerned itself with:

1. The pervasiveness of assumptions in manpower forecasts.

2. The inherent problem of predicting the future.

3. The existence of time lags in the manpower supply system.

4. Failures of forecasts to adequately differentiate among "supply", "demand" and "need."

5. Failure or inability to factor occupational upgrading into forecasts of demand.

6. Market adjustment mechanisms which reflect market elasticities.

7. High levels of aggregation used in manpower forecasts.

Probably the foremost problem of manpower projection is the imposed necessity of imposing certain assumptions in order to make any forecast at all. Kenneth Ganicott and Mark Blaugh discuss this problem of the pervasiveness of assumptions (1973). In the mid 1960's a special federal study of manpower projections was made by the "Working Group on Manpower Projections" established by the Federal Bureau of the Budget as a special unit under the Bureau's inter-agency Committee on Labor Supply, Employment and Unemployment Statistics. The final report of that working group, Manpower Projections: An Appraisal and a Plan of Action (1967) and Lukaczer, a member of the working group (1968) have presented the findings. Summarizing these findings, manpower projections attempt to combine economic and demographic trends with assumptions about future developments in order to make projections. In short assumptions about the continuation or change in economic and demographic trends are combined with assumptions about other variables in order to predict the future. A relatively recent Manpower-Report of the President (1972) illustrates the effects of differing economic expenditure assumptions. It notes that the number of engineers required per one billion dollars of expenditures in the economy has the following range - 900 engineers if the money goes for personal consumption expenditures, 1250 if the money goes into construction, 200 engineers if the money is spent on capital goods and 5000 engineers if the one billion goes into aircraft or ordnance procurement. One has only to envision a concerted national effort to solve the energy crisis to see what the effect would be on demand for engineers.

Manpower forecasts are by definition predictions of the future. One has only to look at the past twenty years in this country's history to give one grave doubts about our ability to predict the future. Lester (1966) suggests that there is some stability in the occupational patterns "in many industries" over a decade and that perhaps changing patterns of occupational mixes may be known up to five years in advance. He also notes, however, that in some occupations it might take as long as fifteen years to complete the educational requirements. Yet, in his discussion, he is referring to occupational patterns within a given industry. This does not even address the rise of new industries, technological advance, the rise of new occupations, and the upgrading of existing occupations. Consider, for example that in the beginning of the 1950s there was no significant nuclear industry, computer in-

dustry, or missile industry. We are presently projecting an excess of teacher supply over demand. Yet, not too long ago half of the nation's elementary school teachers had less than a baccalaureate degree.

There are considerable time lags in the manpower supply system which further confound the ability to make good manpower forecasts. It is known that manpower supply and demand react to market forces. There are, however, lags in market responsiveness as discussed by Freeman (1971). There are both "training lags" and "information-decision lags." It was once estimated that the lags in a trade were such that a generation was required to correct an imbalance in supply and demand (Marshall, 1936). Lester as previously noted talks about a 15-year lag. Training lags of from 11 to 12 years can be expected in professional training. However, these are only training lags. To this must be added the information-decision lag which is required for information about the needs of the profession to be reflected back into the elementary and secondary schools and into the culture. The size of this lag depends upon too many things to even make an estimate. Freeman discusses these time lags in detail (Freeman, 1971).

Another factor in using manpower forecasts for educational planning is that they do not in fact predict "demand" at all. This is particularly true when one uses trend-line projections as opposed to economic projections or judgmental projections. Trend-line projections and the selection of manpower coefficients in reality forecast a complicated interaction of "supply" and "demand" working to influence one another in the manpower marketplace. In addition, "need" is also involved in the interaction in that certain societal needs for trained manpower must compete with demand in its relationship to supply. For example, certain needs do not have the required financial capability to compete with demand backed by a higher ability to pay. If there is a true need for a service, then there will have to be labor-labor substitution or capital-labor substitution or the need will not be met. This kind of interaction can be seen in the area of medical services today where a need for medical services is being met by the introduction of labor-labor substitution; registered practical nurses for registered nurses, medical para-professionals for doctors. One might compare the differences in "need" for 1975 as projected by Lecht (1969) and "demand" for the same year contained in the Manpower Report of the President (1967).

Another phenomenon ignored in forecasts of manpower demand is the phenomenon of occupational upgrading. Educational requirements for a profession generally go through a development which proceeds from college graduation not expected, to college graduation desirable or expected, to college graduation required. It has become "chic" recently to question whether college degrees are really required for some jobs. Some even see such requirements for degrees as nefarious plots to repress minorities. However, it would seem that an employer is the best judge of appropriate credentials for his employees. Lester (1966) notes some of the factors which have led and will continue to lead to occupational upgrading. Among these are:

1. High risks and obligations inherent in collective bargaining.

2. Shift from hiring for a specific job to hiring for a career with the organization.

3. Educational credentials as proxy for personal attributes and cognitive skills.

4. Less management problems of the more well educated.

5. Work force flexibility of the more broadly educated.

6. Availability of more highly qualified workers under conditions of surplus of supply compared to demand.

Folger, Astin and Bayer (1970) consider occupational upgrading as a major factor in demand along with replacement and growth in existing occupations. They estimate that between 1950 and 1965, colleges produced about 900,000 more male graduates than were required for simple replacement and occupational growth purposes. These 900,000 male graduates were available for updating or upgrading the work force. They anticipate that from 1965 to 1980 educational institutions may be expected to produce almost 1.8 million more than are "necessary." They note that there is no evidence to support the fact that the 900,000 represented anything but a benefit to our overall economy. There is also no evidence to indicate that the individuals do not consider their education to have been a benefit. By implication there is no evidence that the 1.8 million excess between 1965 and 1980 will do anything but benefit the overall economy. In spite of difficulty in getting first jobs there is no evidence that the 1.8 million will be subjected to long-term unemployment or so-called "underemployment."

There are a variety of mechanisms that operate to adjust supply to demand in the manpower area. There are in effect elasticities in both the supply and demand for educated manpower. For the most part, the various market adjustment mechanisms themselves invalidate any forecasts made for a long term in the future. Some of these various mechanisms that have been relied on in the United States are discussed by Folger and his coauthors (1970). They are (1) expansion and change of the educational system, (2) attempts to attract students into high-demand occupations, (3) drawing on the labor reserve to fill new demands or changing demands, (4) changing requirements for entrance to particular occupations or leaving entry standards flexible, (5) using sub-professional personnel, (6) using retired persons and (7) fostering geographic and occupational mobility. In addition, one might also suggest the ability to substitute capital for labor as a means for meeting inadequate supply. Also, there are the various information and economic factors which operate to influence individuals into choosing a particular occupation or switching their occupation.

A significant problem of manpower forecasting as applied to educational planning is in the levels of aggregation possible for manpower forecasting. When forecasting manpower demand for the future, gross aggregations of occupations are used. Used are such categories as white-collar, blue-collar, engineers, scientists, teachers. Within all of these categories, there is a significant variety of types. Educational institutions do not train engineers, they train mechanical, chemical, electrical, nuclear, mining, civil engineers and so forth. The same can be said with respect to any of the other of the professional aggregations used in manpower forecasts. For example, how helpful is a projection of demand for allied health personnel? The specific demand forecasts within allied health fields depends upon the specific medical delivery system assumed or postulated. Present Commonwealth educational budgeting is based on less than 50 aggregations of disciplines. At Penn State there are approximately 200 majors and within these various majors there are various degrees of emphasis. Even this says nothing about the correspondence of these 200 majors with the thousands of different occupations into which the various majors might fit.

Student Aspirations, Program Selection, Subsequent Employment

The manpower system of the United States has three important characteristics; these are:

1. It is national policy to provide individuals with great freedom in making career or occupational decisions.

2. The nation has a broadly flexible educational system which can supply the various kinds and qualities of individuals needed for the economic sectors.

3. The system provides a flexible set of mechanisms whereby individuals can move into the various occupations within the economy.

Within our society, questions of manpower supply and demand must be considered within the constraint to a national commitment to individual freedom in preparing for and selecting one's type, level, and place of occupation. Private enterprise and local responsibility characterize American education. As these characteristics have served the nation well in the area of its economy, they have also served it well in providing that society with the trained manpower that has been needed. Our system is not an impractical ideal but a pragmatic response to the realities of our economic and societal system. In his study of Western European nations, Weathersby (1972) found that the proportion of people by skill level in different sectors of the economy differed by as much as a factor of ten. Thus when we look at the variation in labor input coefficients in a manpower projection model, we recognize that a viable system could be embodied in many different sets of coefficients. There is no optimal mix, only 'satisficing' mixes based on culture, economic conditions, national objectives and so forth. Where this represents the reality of a "system" for satisfying a societal need, it seems best to let the mechanisms of the marketplace operate freely to establish levels of services and occupational mixes. Thus our commitment to freedom of choice serves to provide 'satisficing' conditions where there are no theoretical or value free bases on which to predicate appropriate societal systems.

It is difficult to define "teaching" and "learning". It is even more difficult to form a direct bridge between what is taught or learned and the directly applicable cognitive or affective requirements of particular occupations. As a result, systems of education are directed toward educating individuals so as to prepare them for a continuum of jobs relying on on-the-job training for the finishing touches which fit a particular individual to a particular job. Because of this uncertainty in the "training" or education requirements for jobs and because of the commitment to freedom of occupational choice, our educational system is characterized by a variety of institutions, a variety of programs, and a variety of levels of education.

Additionally, our historical tradition of institutional freedom has also allowed institutions to respond in different fashions to differently perceived needs. This has resulted in an historical progression of "liberal arts" colleges, to "land-grant colleges," to "research-oriented universities" and lately to "comprehensive community colleges." All of these remain today sometimes combining the goals or objectives of some combination of them. An additional dimension of flexibility is added within our educational system by a commitment to the idea(s) embodied in such words or phrases as "liberal education," "general education," a "common core" and so forth. Grossly simplifying, it presents an attempt to provide a broadening, humanizing, civilizing, socializing, common learning experience for all, especially undergraduates as a means of generalizing an otherwise narrow or specialized learning experience. A whole host of authors, Bell (1966), Dewey (1916), Hook (1946), Hutchins (1936), Van Doren (1943) and many others have dealt with this area of concern and controversy. In summary, our history and an inability to show any commanding correlations between what goes

on in higher education and later career outcomes has reinforced the desirability of the evolved flexibility.

A job title tells one very little either about the things that a person does or about the kind of preparation required for an individual to fill that job. This is particularly true with regard to most higher level manpower. Even our professional societies differ on the appropriate training for their members. Our Supreme Court's chief justice recently called for extensive reform of U.S. law schools (Burger, 1973). Think of a job title and consider the possible variations in what individuals with such job titles do. What do "engineers," "social workers," "professors," "businessmen," "managers," "personnel officers," "mathematicians" do and what is the appropriate training for such jobs. Anderson has noted that

> with a few exceptions we do not have distinctive college level or high school level jobs, but only central tendencies with a wide variability. (Anderson, 1967)

A National Science Foundation study found that flexible job requirements and less than rigorous definition of job titles led to great diversity in the relationship between college major and subsequent employment (Bureau of Social Science Research, Inc., 1963). This study simply confirmed previous studies. Subsequent studies have shown similar findings. Correlation between curriculum and subsequent employment varies with the type of curriculum, the level of education, time since graduation, the employment market, personal values, and probably a whole host of other things unmeasured or unmeasurable. Folger, et al (1970), Freeman (1971), and Wolfle (1954) all report similar findings. Although education does provide a certification function, it is a loose one. Employers use educational degrees as only one of the criteria in selecting from a pool of potential employes for a particular field. In short, our system of job placement matches our educational system in its flexibility.

Institutional Adjustments

The incipient switch in the Commonwealth's philosophy of educational planning and budgeting would seem to be an ineffective way to address the postulated problem. The problem has been posed as one of redressing the imbalance between the supply of and demand for graduates of various curricula. Placing the solution of this problem upon individual institutions, and in addition only to the public supported institutions would be ineffective at least and possibly dangerous.

Many authors have researched the factors influencing the career plans of students. Folger and his coauthors reflect the common finding regarding the difficulty of changing the career aspirations of graduates (1970). They note that there has been but "limited success" in changing career plans of students at any levels of education. They note that supply and demand seem to have little affect on student plans. They find that the predominant influence is the student's attempt to find careers consistent with their interests and aptitudes. They also note the tendency of academic pressures to"...move students from the more demanding toward the less demanding occupations." (p. 12) In view of these kinds of findings, how is an institution alone to redress the postulated imbalances. To discourage a social demand in one place is simply to transfer it elsewhere. Brubacher (1965) notes that instrumental values are very important in the undergraduate mind. It would seem therefore that what is important is to get appropriate information to students and allow them to make up their own minds as to what curriculum they will elect. To try to force students into programs which are not

consistent with their interest and aptitudes would certainly seem to be unsound educationally and contrary to our national philosophy of freedom of choice. The first two years of college education for most students is a time of searching and of looking. Research by this author on Penn State students at University Park found that, on the average, fifty percent of students changed from one college within the University to another college within the first two years of higher education. Changes within colleges when combined with across college changes would substantially inflate that percentage. Itwould seem warranted to conclude that attempts to restrict students in the program for which they can qualify and then try to hold them in these programs could have unfortunate consequences both for the effectiveness of education and for the students' overall well-being.

The question of levels of occupational manpower aggregations has already been raised. It needs to be raised again in connection with the ability of institutions to make appropriate adjustments. Institutional programs do not fit the high levels of aggregation posed in manpower forecasts. Yet it is by programs that institutions must direct the study of their students. Within any of the aggregations posed for control, there may well be programs which should not be "cut back" but instead "increased." Considering the present surplus of "teachers," there is very little question that there is no oversupply of "remedial reading teachers," "speech and hearing therapists," "vocational education teachers," and even teachers in some areas of the "sciences."

SUMMARY AND CONCLUSIONS

In summary, this paper proposes that:

1. There is a pressing need for a variety of manpower studies.

2. Such studies are needed to inform the educational decision making of potential students, institutions of higher education, and governmental budgeting, planning, and coordinating agencies.

3. Such studies should be directed primarily toward informing students so that they can be informed of growing opportunities and of limited opportunities where appropriate.

4. Institutions are limited in their abilities to redress the imbalances between supply and demand of manpower.

This paper also suggests that governmental budgeting, planning and coordinating agencies should be wary of using manpower forecasts as definitive control inputs in the funding of higher education because of limitations on the applicability of such forecasts. Counter-indications to the use of manpower forecasts can be found in:

1. An increasingly important potential for educational consumerism.

2. The important part which assumptions play in manpower forecasts, and the great potential for error in such assumptions.

3. The extreme difficulty of predicting the future, particularly in complex social systems.

4. The tendency of time lags to confound the problem of manpower forecasts.

5. The fact that educational forecasts do not take into consideration occupational upgrading as a significant factor in manpower forecasting.

6. Market elasticities and adjustment mechanisms which given time to operate, automatically serve to adjust supply and demand.

7. The inadequacy of the levels of aggregation used in manpower forecasts relative to the planning levels within institutions of higher education.

Finally, the author agrees with the countless others who have said it before and better that given the imponderables and unmeasurables inherent in our economic, societal, and educational systems we already possess the tools for providing the nation with appropriate quantities and qualities of manpower. These tools are found in:

1. Freedom of occupational choice for individuals.

2. Equality of educational access as a national goal.

3. A flexible educational system providing program variety.

4. Flexible mechanisms for selecting individuals to fill the various jobs provided by the economy.

Howard Bowen (1973) has provided an appropriate summation. He notes that what the nation needs is:

> ...an educational system that continues and extends the American tradition of responding to the free choices of students. Such a system would not only accommodate students in conventional age groups, but also provide ample second chances for students who may have erred in youthful decisions or who may want additional education in mid-career. The number of places in various programs and in the whole system would be set in response to student choices, not in response to dubious market projections. (p. 11)

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V

OCCUPATIONAL PROJECTIONS FOR THE 1980S

This presentation emphasized that in considering the future scenario many people and many assumptions must be involved and considered. The difficulties in making long-range projections was highlighted with the indication that the assumptions in the process demand careful examination and a continuous monitoring mechanism.

In describing the projections for the 1980s it was pointed out that the information should provide a general awareness of the future transition from school to work. In summarizing the changes in the occupational structure it was indicated that there will be a continuation of shift from goods producing to service industries. The changing status of women in the work force, the declining birth rate, the apparent oversupply of college students, and the problem of underemployment were highlighted as significant variables for the 1980s.

OCCUPATIONAL PROJECTIONS FOR THE 1980s

Janet L. Norwood*

Although many issues will be discussed at this symposium, I decided that I would talk about the 1980s because it is important to take a long-range view. It is important for someone like me, who does not have the close familiarity with the particular issues that many of you have, to indicate my view of the kinds of programs the Bureau of Labor Statistics has in this field. It is important to look at the various relationships, and especially at how the programs that we have interact with the people who use the data. The producers and the users must work closely together.

A manpower planning policy is, as everyone I am sure will agree, very much dependent upon economic policy, educational policy and even on social policy. All planners in each of these areas need to know what is down the road ahead. What new demands will there be that require advanced planning? What can we anticipate? What should be done now in order to be more prepared for the future? Effective action in any of these areas requires, I think, careful planning. In my view, careful planning requires information--information on the past, information on the present and information on projections of what we might expect for the future.

We all know that the business of long-range economic projections is very difficult. Nobody can predict the future with certainty. I was very much interested in an article in the Wall Street Journal last week reporting on a controversy between the meteorologists and the climatologists on the feasibility of making long-range weather forecasts. They all agreed that truly long-range forecasts of climatic change could be of very great value. Governments could use them to decide where to locate dams, cities and agriculture. Disasters, floods and avalanches could be minimized. The problem was that people disagreed on the availability of the data necessary for the forecasts, because, according to the article, good records only go back 200 years. There was disagreement on the methods for using the data, especially on the conclusions to be drawn from the records over the past two or three decades. The meteorologists argued that they did not understand the fluctuations of the recent past. "Until you understand," one of them said, "you cannot begin to predict."

I think that we as economists are in a far better position than the weather men. First of all, we in the Bureau of Labor Statistics, always emphasize that we do not make forecasts. Rather, we make projections. We estimate what the economy might be like in some future period, in the most recent case, 1980 or 85, given a series of basic assumptions. The projections system involves a number of check points to see that the projections made at different stages in the sequence are mutually consistent. They must be and are based upon a set of carefully articulated assumptions.

Secondly, we can base our projections on reliable data, far more reliable, I think, than the weather forecasters. And in my view we have a far better understanding than those forecasting the weather have of theirs. We know how these data have behaved in the past few decades. We also have a far better understanding of how the various data elements interact with each other.

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As you know, the BLS has recently completed a set of new projections that outline the job prospects to 1985. They should provide a more general awareness of the future transition from school to work--more awareness than young people and educators would have without these projections. We must always remember however, that the projections are based on sets of assumptions, and we know that the projections can only be as good as the assumptions on which they are based. To the extent that these assumptions may prove wrong--and some of them certainly always will--then adjustments in the projections have to be made.

We in the BLS feel we must always be vigilant to reexamine what we have done and to make changes when it appears that the changes are necessary. We must be careful to look at the data in the projections for the future against the context in which they are made. If you have a particular problem that occurs in a given year, it may be something that had not been anticipated. Our assumptions have to cover rather volatile areas. How will our population grow? What is going to happen to demographic or age profile of the labor force? How will the economy fair? What will production, consumption and social patterns be? Once these assumptions have been made, BLS, as you know, uses a great many projective techniques, including input-output tables, occupational matrixes, growth models and analysis of technological trends.

Let me refer very briefly to a few of the general aspects of the BLS projections, and then take a look at some of the current problems we are having to see how realistic the projections were. Our assumptions for the 1985 projections were 1) that unemployment would reach a four per cent level in the mid 1970s and remain at about that level through 1985, and 2) that the GNP price deflater would increase by an average of about three per cent a year over that period. Those assumptions, already I am sure you recognize, are not realistic. In addition, we assumed that the population would grow just enough to replace itself and that no major changes would occur in the overall institutional framework or in the present economic and social patterns. In particular we assumed that the values currently placed on work, education, income and leisure would not change markedly. Now, how realistic are these assumptions today. We read about recession, we read about energy problems and we read about inflation. What do they really mean for the reasonableness of our projections? Obviously, no one can be sure. In looking at this question, I picked up a BLS bulletin called Projections of the Post Vietnam Economy, 1975. This is not an occupational projections bulletin, rather it is a publication on industry projections. I wanted to see what we had projected for 1975. The first paragraph of that bulletin hit me rather hard. It said in part, "This report presents projections of the U.S. Economy in 1975, under the assumption that the withdrawal of U.S. Forces in Vietnam will be completed and full employment achieved." The unemployment rate was assumed to decline to 3.8 per cent by 1975. I was not very happy when I read that. But you know, people who work with BLS have to be very careful about jumping to conclusions. So I decided that I had better read through the entire bulletin before I decided where we were and how well we had done. And this is what I found.

Each of the following points is a quotation from the bulletin. One, employment is expected to decline in the goods producing industries. Two, there will be a continued decline in employment in agriculture. Three, continued employment declines in mining are projected through 1975 although at a reduced rate because of some resurgence in the demands for coal. Four, and this one doesn't fit with the others, construction employment will increase sharply. Five, continued growth will occur in services and in government employment. Six, although we did not predict the energy crisis, we did say in this bulletin that, "Increased demand for coal for electric utilities and for export may require opening new mines with the

consequent slow down in the very high increase in productivity which prevailed during the period of mechanization of the industry." So it seems to me that while we did not have perfection we didn't do too badly either.

It is important to remember that these projections are projections of the economy over a long term and that the assumptions are based upon what will develop over a 10 year or longer period. Erratic movememts in a particular year may therefore not have an enormous effect upon the final outcome. In any case, I think it is far too early to determine whether the current recession or the energy problems this economy faces represent a serious problem for our entire projection program.

A project to revise the latest projections by changing some of the assumptions, in particular, the energy assumptions is well underway in the bureau. We are picking out those assumptions which appear to be most important to see what these differences, if any, will be on the projections.

What I am saying is that any data system must be flexible and must be constantly changing. And users of these data systems must recognize that fact. In spite of these qualifications and these warnings, I believe that these projections are of very great importance. I think that unless they continue to be made, assessments for policy planning cannot be made.

Now, let us take a quick look at what we have projected. What can we anticipate the world for 1985 will be like? We start with the labor force projections. The labor force will be larger, but it will grow more slowly in the next decade than in the past. The labor force will be older, and this I might point out is extremely important. Post World War II babies will be adults. The 25-to 54-year age group in the labor force will increase. Women will continue to constitute a very important segment of the labor force. The birth rate is expected to be much lower than before. And more women housewives will continue to work.

So far as occupations are concerned, there clearly will be a continuation of the shift from the goods producing to the services industries. Employment of some occupational groups will increase at a faster rate than others. Professional and technical workers, for example, will increase faster than occupations in other major groups. Clerical worker jobs will probably continue to grow and some of the other occupations--sales workers, craft workers, operators--will continue to grow but at a slower rate than in the past.

Perhaps the most important element of these projections is that they indicate a major shift in the supply and demand for college graduates by 1985. We expect a surplus of 100,000 to 140,000 college graudates per year. This means that there will be a surplus of people with educational qualifications compared to the jobs requiring those qualifications. Obviously we are only talking here about occupational oversupply. Certainly no one would argue that education has a value only for job preparation. Young people go to college for a variety of different reasons. I was indicating before that one of my sons who is a college junior is a philosophy major. I must say that one day sending in the tuition check I did wonder what the demand in 1985 might be for philosophers or for BAs in philosophy. I don't think the Occupational Outlook Handbook even mentions philosophers. However, I think that that kind of an education is very useful and very important, and we certainly should not overlook the other advantages of education.

Nevertheless, I think it is tremendously important for all of us to be realistic, to be realistic about what is going to happen in this shift from school to work. We must recognize what the probable oversupply of college-trained youth is going to mean. Clearly, there will be an increase in the proportion of college

graduates who will have to take second choice jobs. The underemployment, which will thereby be created, may well lead to job dissatisfaction and to disappointment in the expectations of many young people. In addition, we can anticipate that workers with less than a college education will probably feel strong competition from people who hold degrees.

As a nation we must recognize that one of the biggest problems of the 1980s will be the search for methods of dealing with the increasing problems of job satisfaction, the increasing difficulties faced by workers who have a lower level of job satisfaction than in the past. The decade of the 1980s will clearly present very real challenges. It seems to me that these challenges can only be met by joint efforts by people who are specialists in education, people who are specialists in employment and in manpower training and people who are specialists in producing data. These groups must work together so that the users can indicate to the producers of data what are required. And the producers of data can be sure to explain fully to the users what the data means, what their limitations may be, what kind of improvements can be brought about and how they should be used.

VI

WOMEN IN THE WORLD OF WORK
&
SUMMARY AND FUTURE DIRECTIONS

The final general session focused on a major presentation regarding women in the world of work and the symposium summary and future directions for manpower research.

Significance was attached to the fact that the changing status of women workers and the national commitment to equal employment opportunity for women is and will continue to be a significant variable in any valid manpower forecasting development efforts.

The symposium summary and future directions emphasized that more attention be given to the development of assumptions which go into any forecasting and projections models. Attention to past trends was emphasized but a very important suggestion was offered to draw different scenarios and then begin to forecast and project.

WOMEN IN THE WORLD OF WORK

Mary N. Hilton*

It is a pleasure for me to have the opportunity to participate in this symposium and talk with you for a little while about women's place in the labor force. I can understand it if at this hour it isn't as great a pleasure for you to hear me.

I would hope that in all of your discussions of labor market and occupational information and of manpower and educational planning you have had fully in mind the changing status of women workers and our national commitment to equal employment opportunity for women which must be taken into account in any realistic forecasting and development of educational and manpower plans.

Let me review a few facts about women today including women's participation in the labor force and some of the concerns that we must have for women's occupational choices in the future--facts that you will need to put into perspective in your particular concerns. From a national viewpoint I suppose the most striking thing about women in the world of work is that there are so many of them--more than 36 million in April of this year. And another remarkable fact is that women's attachment to a labor force continues strong in a period of recession. A year ago women accounted for 39 per cent of the labor force and today the figure is close to 40 per cent. Of course this change is not new. Since 1965, women have accounted for nearly 60 per cent of the net growth in the civilian labor force. At the same time we have seen significant changes in the characteristics of the female work force during that period. The age factor I think is particularly interesting. During the 1950s and early 1960s, there was a dramatic growth in the proportion of older women in the work force; women, as their children reached school age or the time the family thought appropriate, reentered the labor force or entered it for the first time in growing numbers. However, since the mid 60s there has been an upsurge in labor force participation among younger women and between 1964 and 1974 the proportion of women between the ages of 20 and 24 increased from 50 per cent to 63 per cent and the increase for women in the 25 to 34 year bracket was from 37 per cent to 52 per cent. Accordingly, today the median age of women workers is 35 years as compared to 41 as recently as 1960. And the increased labor force participation of women in the prime child-bearing years has meant, of course, a rising proportion of young working wives and mothers. In March 1975, 39 per cent of women with only pre-school age children were in the labor force as were 47 per cent of mothers having children under 18 years of age. Of course this trend explains the growing interest and concern for day care services which you will find everywhere in the United States.

The growth in the labor force participation of women with children accompanied an overall increase of labor market activity among married women. In 1950 about half of the single women were in the work force and that percentage hasn't changed substantially. By comparison the increase for married women with husbands present was spectacular--from 24 per cent in 1950 to 43 per cent in 1974. Similarly, we have seen a change in what characteristics of the respective husband's income are reflected in labor force participation. At one time the income of the husband was a determining factor. The work force participation rates for wives with husbands at all income levels has continued to rise during the last 20 years, and at the present time, the highest participation rates are among wives of men earning between $7,000 and $10,000 a year. Today, among nonfarm wives, wives contribute slightly more than 26 per cent to the family income.

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I have called these basic facts because I think they have to be taken into account in making any realistic forecasts or projections concerning the future. They indicate, I think, that projections based on the past are not going to be the meaningful ones in terms of what will be required with respect to women workers.

As Janet Norwood pointed out, one of the important factors has been the drop in the size of the average family since the late 1960s and the growing acceptance of the childless family and the working mother. At the same time these changes have been taking place, and in some cases related to them, there has been passage of landmark legislation prohibiting discrimination in employment on the basis of sex. Since 1963, we have had the passage of the Equal Pay Act, Title VII of the Civil Rights Act which prohibits discrimination in employment, and Executive Order 11246 which prohibits discrimination in employment by government contractors.

In fact, as far as women are concerned, aside from the Equal Rights Amendment which many people believe will be approved by the remaining four states next year, most of the basic legislation needed to assure equal employment opportunity for women in the economy is in place. The challenge now is to implement that legislation; this will require a variety of actions on the part of employers, in many cases changed attitudes on the part of educators and, of course, some changes in the attitudes of women themselves.

The basic problem in many cases is that our society still clings to old stereotypes concerning the kinds of work women should do. The result is that women continue to be concentrated in the lower-paying, lower-skilled jobs that pay less and offer little opportunity for advancement. At the present time, only 5.5 per cent of women workers were managers and administrators; only 16 per cent were professional and technical workers (mostly teachers and nurses), and less than 2 per cent were craft and kindred workers. But almost 35 per cent were clerical workers; 11 per cent were operatives (mostly in factories) and 18 per cent were service workers other than in private households. However, there is a very encouraging trend toward greater participation of women in training for the legal profession and the medical profession, and we can begin to look forward to that kind of a change in the occupational structure.

As a result of the present concentration of women in lower paying and less skilled occupations, their earnings are considerably less than those of men. In 1974, the median annual earnings for women, that is women who work year round, full time, were slightly more than 57 per cent of what men earn. This, interestingly enough, represents a widening of the earnings gap, since women earned 60 per cent of what men earned ten years ago. I do not regard this as a negative factor exactly because I am sure that if present trends continue, we can look forward to a narrowing of the gap. This will certainly require emphasis on training women for nontraditional jobs, on women accepting nontraditional jobs, and puts emphasis on the need for counseling and guidance and all kinds of efforts to change attitudes generally.

The Women's Bureau, which I represent, has as its purpose to promote the welfare of wage earning women and to that end over our 55-year history our task has been to educate, to provide technical assistance, and to get out as much information as we can to help groups who are concerned with questions related to working women. Obviously we don't collect this information ourselves. We analyze and summarize data collected by the Bureau of Labor Statistics, by the Census Bureau, etc. What our experience demonstrates is the great need for information to be made available to people in a form that they can understand. This is particularly true for many women's groups and for many employers all over the United States. Even when we have prepared material that is elementary really, such as state by state summaries of 1970

census data that relate to women, we have a tremendous demand for that information. There are all kinds of people who simply don't know the kind of information the government has available. We have prepared basic things in response to requests from employers who are trying to develop affirmative action plans. We have even prepared simple little leaflets that suggest recruiting sources they might tap. At the same time, women, themselves, often do not know what their legal rights are, and we have prepared materials for them including a summary publication called A Working Woman's Guide to Her Job Rights. And I have been astonished that an elementary bulletin which summarizes what a person's job rights are would be so popular that 80,000 women within a period of two months would write in and say, "please send me a copy of that publication." The point I am making, and it is such a basic one, is the crying need for material that wil help people understand what their rights are and what information is available from the federal government or from the state government or from the local government.

One of the urgent concerns, as I have mentioned, is the need to encourage women into nontraditional jobs. The Women's Bureau and the Manpower Administration have been working together, as one illustration, on a project to train women for and place them in apprenticeable occupations. Actually there is considerable evidence of a growing acceptance of the need for employment opportunities for women in apprenticeship jobs. I do also want to mention the interest that women's groups and the Women's Bureau, of course, have in the implementation of CETA. We are concerned that women's interests be given full consideration in CETA projects; and that women have a part in the planning and policy-making for CETA programs. Our task, and I hope it would be a task of anyone concerned with CETA, is to encourage women to participate through their organizations and as individuals by serving on the state and local manpower planning councils required by the act, by reviewing comprehensive manpower plans and questioning why there aren't more programs directed to the specific needs of women.

Against this very general background, I would like to conclude these remarks with an invitation to all of you. As you may know, 1975 is International Women's Year. It is a year that has been designated by the United Nations and is going to be marked by an international conference in Mexico City next month. The real thrust of the year is to encourage individual countries to move forward, themselves, with respect to women's rights and status.

One of the contributions that the Women's Bureau expects to make to International Women's Year is a conference in Washington, D.C. from September 11 to 13 on the theme "Women in the Economy: Full Freedom of Choice." I, at this time, would like to extend a cordial invitation to any and all of you to attend. And I hope that if there is any way we can be of assistance to you, if we can cooperate with you, that you let me know or that you will call on our Assistant Regional Director, Kathleen Riordan, in the Philadelphia region.

LOCAL, STATE AND FEDERAL MANPOWER RESEARCH AND INFORMATION: PROCESS, ARTICULATION PROBLEMS AND FURTURE DIRECTION

Seymour L. Wolfbein*

As I listened to all the fine presentations made today, I was wondering, what will the topic be for next year? I think it might very well be a good idea if we take as our theme next year the topic "What assumptions shall we make for the future."

Janet Norwood spelled out for you all of the assumptions we are using today. It took courage to spell them out. But whether you spell them out or not, that's what really makes the difference.

Imagine if you brought the same group back here and asked them to go through their deliberations with an entirely new set of assumptions. I suspect you would really see the fur fly. Let me give you a few examples. Then I will make my own predictions, as I indicated I would earlier, and then we will conclude for the day.

As we begin the fourth quarter of the century I think there are a number of critically important and surpassingly important reversals occurring in this country. A really big switch has occurred between what happened in the third quarter of the century and the beginning of the fourth. Ponder it sometime and see if it really isn't true that if we look these straight in the eye, we might come out with some quite different assessments--even in the technology of how we make our assumptions.

For example, in the first year of the fourth quarter of this century we had a significant reversal in form in productivity, the first time in which we really have seen a persistent, consistent decline in annual output per man hour in this country since the end of World War II. The Bureau of Labor Statistics' most recent release notes that we have had the eighth consecutive quarter of decline in output per man hour in manufacturing, an enormous corresponding increase in unit labor costs, the biggest one since we began calculating the series. Productivity will no doubt move up again as the economy emerges from recession, but the big question before the house is will it last, will it be enough, will it take hold in a service-producing economy, will it keep us competitive in an internationally competitive world?

I see another reversal in form. That is, in the midst of this very service-oriented economy, our needs more and more are for people with manual talent. This is not to derogate the importance of professional and other white-collar occupations. But the last quarter of a century of education and training has produced a serious imbalance, with shortages of personnel who can keep this country in good repair, who can maintain and even accelerate our technological excellence. We are going to have to put more and more of our educational chips in that arena, as indeed we are trying to do at Temple University, by deciding to create a College of Engineering Technology rather than another College of Engineering in order to provide people with the talent to support the professional personnel. So far, the job prospects for those graduates has been excellent.

And finally, if you want another example of a recent reversal, think about the change in the geography of American industry. Did you know that just three states--

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California, Texas and Florida--now account for one out of every five jobs in America? Do you know why? Have you looked at the latest census release? Those three states alone, from the period 1970 through 1974, accounted for 38 per cent of the population increase in the U.S. of America. And I remind you again, those of you who may be from the Commonwealth of Pennsylvania, what state has the highest rate of out-migration in America. Not Alabama and Mississippi, the way it used to be in my youth. It's the state known as Pennsylvania! Watch the geographic ball bounce.

So, maybe the next time around, looking toward the future, we might want to open some of these Pandora's boxes, asking what they really hold in store for us? What does it mean for the way we deploy our education and our occupational information or how we provide for it?

And now finally, just to give you an illustration, I want to predict for you who is going to be the President of the U.S. in the year 2000. About a month ago I was giving a speech, as I often do as you can tell by now, to a group of executives from RCA in Camden, New Jersey. We were batting around the matter of making projections and they were talking about their projections for their company. Somebody said, "If you're so good at predictions, tell us who is going to be President of the U.S. in the year 2000?" Well, I am not going to put you on, I simply said I didn't know, but I said I would be in touch with him if I ever found out. And as I was crossing the bridge back to Philadelphia in a traffic jam, with plenty of time to think, the following came to mind:

What, I asked myself, would someone living in 1900 say if someone asked: Who is going to be President of the United States twenty-five years hence, i.e., in 1925? Anybody here old enough to remember? It turned out to be Calvin C. Coolidge of Massachusetts, Vice President who succeeded to the presidency upon the death of his predecesor. Now what if you were living in 1925, and someone again asked who is going to be President a quarter of a century hence, i.e., in 1950. Who would it be? Harry S. Truman of Missouri, Vice President who also succeeded to the presidency on the death of his predecesor. What if you were living in 1950 and someone again asked who would be the President of the U.S. a quarter of a century hence, i.e., in 1975. Gerald Ford of Michigan, also vice president who succeeded the presidency on the unscheduled departure of his predecesor. Now, note the pattern: It's a man; it's a vice president; it's a man who succeeded to the office on the unanticipated exit of a predecesor. You can actually plot all these points, have regression equations and even have matrices to project all of this to the year 2000.

Of course you know the projection I came up with: I said it was going to be a woman who was never a vice president, who just made it on her own, and who came from a state which begins with the letter N. Now I'm a hero with all women's lib groups and they love me in New Jersey, a state which begins with the letter N.

All of this may have been said in jest, but it made a very important point: That it may very well be that in looking ahead to the relatively long term, we may indeed have to disregard many of the parameters which seemed so consistent, so persistent in the equally long term ago.

I thank you again for being such a good audience. You laughed at the right time, even answered a few questions at the right time. Thank you very much and I look forward to talking about the future with you in the near future.

APPENDIX

Manpower Symposium Participants

Manpower Symposium Participants
Hershey Motor Lodge and Convention Center, June 9-10, 1975

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